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*MANUAL*  
*FOR*  
*ARMY MEDICAL SERVICES.*

*SURGEON-MAJOR RIORDAN.*

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MANUAL FOR

# ARMY MEDICAL SERVICES

BY

WILLIAM E. RIORDAN,

Surgeon-Major Medical Staff.



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## THE CAUSES OF ORIGIN OF HEART DISEASE AND ANEURISM IN THE ARMY.

*Medical Press and Circular, December 4th, 1878.*

“The causes of origin of heart disease and aneurism in the army, are laid down by the author as being mainly, if not entirely, due to palpitation; and this palpitation to nervous exhaustion, the “setting up” of the soldiers on parade, at the same time straightening the aorta, and thereby placing this vessel in such a position that the force of the heart’s action impels the blood injuriously against it.

“To remedy this evil influence and its consequences, Dr. Rjordán thus expresses himself:—He says, ‘In suggesting remedies for the prevention or mitigation of diseases of the circulatory system, attention should be principally directed to the special causes, particularly those in connection with the physical training and teaching of subordination to young men, as well as the mode of conducting duties, internal economy, and discipline. There are such a combination of circumstances set at work at the same time, while teaching and remodelling the man, and so connected are they together, so perfect is the system, that it would be extremely difficult to separate them, or trace the tendency or effects of each. So, taken as they are collectively, we may say it is our military system and conditions of service that induce this class of affections, and not any one cause, such as certain diseases, vicious habits, constitutional infirmity, dress, alcohol, tobacco, coffee, quinine, or excessive work. Nor are all these together sufficient, without mental influences, to account for the preponderance and peculiarity of affections of the circulatory system which occurs in the army.”

“The system might be improved by allowing more time for the setting-up, position drill, and training of the soldiers. No matter what his age may be, he should not be subjected to any sudden or violent alteration of his natural shape, or in this manner have his heart or lungs interfered with.”

“Of this little work we can only say that it is written in the interest of the recruit, and with a kindly feeling towards him that cannot but be respected and admired.”

*From “The Lancet.”*

“The main object of this book is to show that the explanations hitherto advanced of the remarkable preponderance of cardiac and arterial disease in the army, as compared with civil life, are insufficient. Mechanical strain alone will not account for the heart disease, and constitutional diseases cannot be invoked to explain all cases of aneurism. Mr. Rjordán advances the opinion, which he states most temperately, and with considerable



## PREFACE.

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As the title of this work to a considerable extent explains the nature of its contents, there is no necessity for a lengthened Preface. The War Office Regulations are taken as the basis of its production, and not such strictly professional subjects as relate to medicine and surgery. In all regulations issued by supreme authority minutiae of detail and explanation are avoided, as they do not come within their province. An endeavour has been made here to give some explanations and details in connection with such matters as are in more or less intimate relation with the routine duties of the Medical Services of the Army, and thus to supply a want which is not unfrequently felt. Herein are collected a variety of orders relating to medico-military matters, which are conveyed in many volumes of regulations, while reference is also made to the general organization and administration of the army and the laws by which it is governed.

In our military organization the present disposition is towards decentralization and the fixing of responsibility on departments and individuals: it is beyond doubt that *responsibility conduces to the development of efficiency*.

In the course of progress, in all constructive systems constantly recurring changes are inseparably connected with the details of their organization; consequently a specific reference

to paragraphs and sections of Army Regulations has, as a rule, been omitted, while their substance is given, and the guiding principles which form the basis of administration are frequently alluded to ; moreover, as this book is designed in order to afford assistance in the application of hygiene within authorized regulations, together with Orders and Instructions are combined references to matters of hygiene relating to the housing, feeding, camping, marching, and moving of troops by sea.

The Medical Executive Services of the Army are so intimately associated with its other military executive duties that they have a reciprocal dependence, particularly so in matters which relate to the well-being of the soldier, his physical conditions, the conservation of his energies and powers of endurance ; thus there has been no attempt made to draw a line of demarcation here or to treat of Services apart, which should be blended together in all harmony, sympathy, and unity of purpose, so as to ensure mutual help and that confidence and conjoined action which is so essential to military success.

I beg to acknowledge my indebtedness to the writings of many authorities in connection with the different subjects embraced within this work.

W. E. RIORDAN.

*Sheerness,*

*April 1890.*



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## LIST OF ABBREVIATIONS.

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A.A.	Army Act.	G.O.	General Order.
A.B.	Army Book.	G.O.C.	General Officer Commanding.
A.F.	Army Form.	M.L.	Military Law Manual.
A.G.	Adjutant-General.	M.O.	Medical Officer.
A.A.G.	Assistant Adjutant-General.	M.R.	Medical Regulations, or Regulations for Medical Services, Part I. and Part II.
A.M.D.	Army Medical Department.	M.S.	Medical Staff.
A.O.	Army Order.	M.S.C.	Medical Staff Corps.
A.Q.M.G.	Assistant Quartermaster-General.	N.C.O.	Non-Commissioned Officer.
Al.Reg.	Allowance Regulations.	O.C.	Officer Commanding.
A.S.C.	Army Service Corps.	O.-in-C.-B.	Officer in Charge of Barracks.
A.S.C.Reg.	Army Service Corps Regulations.	O.-in-C.-S.	Officer in Charge of Supplies.
C.-in-C.	Commander-in-Chief.	O.S.O.	Ordnance Store Officer.
C.M.	Court-martial.	P.M.O.	Principal Medical Officer.
C.O.	Commanding Officer.	Q.M.	Quartermaster.
C.R.E.	Commanding Royal Engineers.	Q.M.G.	Quartermaster-General.
D.A.A.G.—A.	Deputy-Assistant Adjutant-General.	Q.R.	Queen's Regulations.
D.A.A.G.—B.	(A. Executive; B. Administrative.)	R.A.	Royal Artillery.
D.G.	Director-General Army Medical Department.	R.E.	Royal Engineers.
D.J.A.G.	Deputy Judge - Advocate-General.	R.E.Dep.	Royal Engineer Department.
G.C.Badge.	Good Conduct Badge.	R.P.	Rules of Procedure.
G.C.Pay.	Good Conduct Pay.	R.W.	Royal Warrant.
		Sec.	Section.
		S. Area.	Superficial Area.
		S.M.O.	Senior Medical Officer.



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# MANUAL FOR ARMY MEDICAL SERVICES.

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## CHAPTER I.

### MILITARY LAW.

**Military Law.**—The Mutiny Act and Articles of War issued under Royal Prerogative, which formerly ruled the army, were consolidated in 1879 in the Army Discipline Act; this Act was repealed two years later, and re-enacted in the Army Act. Military Law is now embodied in the Army Act, 1881; the Reserve Forces Act, 1882; and the Militia Act, 1882. To these may be added other Acts which are comparatively of but minor importance: such are the Regimental Debts Act, Railway Acts, etc.

Rules of Procedure, Royal Warrants, Queen's Regulations, Army Orders, and Orders in Council are issued "by Authority," within the provisions of the Acts of Parliament. There is a specific difference between the law and all such rules or orders as are issued under the authority of the law for observance, guidance, and instructions.

The law acts on the presumption that every one knows the law: considering how few really do know it, this proceeding is more practical than logical. However, with respect to orders and regulations, there is no such presumption, so proof is required that a person accused of an offence, such as non-compliance with an order, was made acquainted with the order. *See* sec. 11, A.A.

**The Army Act** is part of the statute law, and is not only the disciplinary but also the administrative law of the army. It is a law binding alike on the soldier and civilian, as the civil law is on both, and is recognised in civil courts of justice. Military law is administered on the same principles as are observed in civil courts of justice, but to facilitate procedure and fulfil its object technicalities are as far as possible dispensed with.

The A.A., 1881, in order to have effect, requires to be brought into operation every twelve months by another Act of Parliament. The Army Annual Act thus secures the constitutional principle of the control of Parliament over the discipline of the army.

**The Army Annual Act** states the necessity for a special military code and its object as follows:—It being requisite for

the retaining all the before-mentioned forces, and other persons subject to military law, in their duty that an exact discipline be observed, and that persons belonging to the said forces who mutiny or stir up sedition, or desert Her Majesty's service, or are guilty of crimes and offences to the prejudice of good order and military discipline, be brought to a more exemplary and speedy punishment than the usual forms of the law will allow—In administering the law its primary object should never be lost sight of.

**The Special Characteristics of Law.**—The Hon. Mr. Justice Stephen, in the "Nineteenth Century" for December 1886, said—"The distinctive special characteristic of all law and government is coercion in some one of its shapes. It is this which draws the line between law and advice, between government and speculative discussion. It is because nations have no common superior that international law, commonly so called, is not really law at all, but merely a form of morality . . . force is the specific peculiarity and characteristic of law.

"Look at the whole subject of rights and duties however you please, view them *à priori* or *à posteriori*, look at them from an abstract or an historical point of view, and it remains true that force is the origin of laws, institutions, and legal rights, and also the special characteristic which distinguishes them from advice, opinion, and moral rights."

Here, then, we see *international law* is in substance and in fact no law at all, as it is merely based on the customs and usages of civilization, moral force, and obligations, where policy seems the essence substituted for that force which is the *special characteristic of law*.

**The Relation between Law and Force.**—Considering the above statement in its relation to the army, the testimony of those who were not themselves professional soldiers may be taken.

Sir Henry Lawrence, in one of his essays, says—"At first sight bayonets and red coats do not appear to be precisely the instruments of government which a philanthropist would advocate, but we belie or deceive ourselves when we declare or fancy that our government—in India—is maintained otherwise than by the sword." Here this able statesman advanced the view that beyond advice and philanthropy the essence of the government of India and its consequent stability is force. Lord Mayo, another great statesman, wrote—"I admit to the full that a complete and efficient military organization is the base and foundation of our power here. We are bound to see that every officer and man is fit for immediate service, and that every army and every military requisite is maintained in a state of the utmost efficiency." These are the statements of men who devoted their energies to the relief of the burdens of the people of India and the development of the resources of their country.

**Equity.**—Furthermore, equity, whose province it is to supplement the law, contains within it principles of natural justice, which admit of being “judicially enforced.” Thus equity is only legally recognised where it *can be enforced*. Beyond law and equity are those principles of natural justice of which no judicial notice is taken, yet these are rightly embraced within the spirit of the Queen’s Regulations and Orders for the army.

**Martial Law**, more correctly called *The Customs of War*, is merely the will of the conqueror, who dictates and enforces his own rules. As *law*, such a proceeding is unknown to English jurisprudence: without a code, it is all essence and no argument.

Whenever, on account of domestic insurrections, the civil law has been set at defiance and martial law “proclaimed,” all acts of violence committed on those brought under the powers of this “law” within the British dominions are held to be unlawful acts, and an Act of Indemnity must be passed to free those who authorise such proceedings from the consequences of their illegal acts.

**The Administration of the Law** is governed by the *general provisions* detailed in the Act for military courts and their jurisdiction, where proceedings are conducted according to fixed rules, which also apply to those magisterial powers exercised by commanding officers.

In connection with the administration of the law, the rules which govern evidence must be observed; as our military system is essentially constructive, much is left to be decided in accordance with the customs and usages of the service, the customs of war, and other matters within the military knowledge of a C.O. or a court. Nevertheless, in all cases of *doubt or uncertainty*, evidence in these matters had better be taken to aid in the formation of an opinion or decision. Opinion is formed in relation to facts; it is a decision, the result of evidence on the mind: reason weighs evidence and assists judgment in the formation of an opinion. *See p. 54.*

**Administration**, beyond its immediate connection with law, regulates and directs work to be done, and is necessary for the successful carrying out of legislation and the regulations which govern organization; when not arbitrary, it is governed by fixed rules with a defined mode of action. The province of military administration, in its usual acceptation, is to instruct, regulate, and direct the mode in which duties are to be conducted in conformity with the law and such orders as are issued by supreme or superior authority for general guidance. No person can organize any military body, hospital, or other institution, or retain them in a state of efficiency, without a knowledge of the laws by which they are governed; and their administration, in order to maintain uniformity of action, must be conducted within the lines of their organization. *See p. 129.*



**Crime** has been defined as—"an act of disobedience to a law forbidden under pain of punishment." An *offence* is an act or omission which falls short of a crime, but in military law such a distinction is not made, for what might be regarded as a trivial offence in time of peace, might prove a very serious matter on service. Again, the fact of a soldier being on or off duty makes a vast difference. In civil law the distinction is also made between *misdemeanour* and *felony*, the former including such offences as libels, assaults, frauds, perjury, etc. All persons are bound to act up to the law as well as within the law, hence there are crimes of omission as well as crimes of commission.

**Motive, Intention.**—Motive is stated as that which incites or stimulates to action. There may be many motives for the one action. Evidence of a motive may give a clue to the *intention*. To make a person a criminal the *intention must be a state of mind forbidden by the law*. To obtain a conviction in such cases this guilty state of the mind must be placed beyond all reasonable doubt; but when the law expressly declares an act to be criminal, the question of intention or malice need not be considered (*Cochrane*). Where *intention is the essence of a crime*, there *must be a carrying out, or an attempt at carrying out, the intention by some overt act or omission*. This is reasonable, as the thoughts occur without the consent or effort of the will. So no person can be held legally or justly responsible for his thoughts; but from the mode of their expression, which are acts of volition, the intention may be inferred. See **Attempt**.

**Necessity for a Defined Offence.**—With respect to the administration of the law, there is *no penalty for an undefined offence*. In all cases it is necessary for the accused person to be given to understand the nature of the offence with which he is charged; and, further, the prosecutor must have a defined charge stated before he can tell how he is to prove it. The guilt or innocence of the prisoner with respect to the offence with which he is charged is the *point at issue*. When direct evidence is not available, evidence of facts forming presumptions in relation to the charge must be produced in order to substantiate it—"the facts on which it is sought to found the inference of guilt must be visibly and evidently connected with the crime."

**Accessory.**—"A person who—without being present, aiding and abetting—directly or indirectly counsels, procures, or commands another to commit a felony which is actually committed, is punishable as an accessory before the fact. The instigation must be continuous in the sense of not being revoked before the commission of the offence, and it must be of an active character, and not consisting merely of a knowledge of the intention and a passive acquiescence in the offence. When the crime instigated is committed in a different way, or where the crime, though different from that instigated, is yet a probable consequence of the instigation, the offence is established; but where the crime



committed is different, and not a probable consequence of the instigation, the offence is not established.

"A person who, knowing that felony has been committed, receives, harbours, or assists the offender, with the intention of enabling him to elude the pursuit of justice, is punishable as an accessory after the fact."

**Aiding.**—"A person aiding or abetting, whether present or not, the actual commission of a felony or misdemeanour is punishable; where a particular intention is part of the offence, the aider or abettor must be shown to have been aware of that intention on the part of the principal.

**Attempt.**—"An attempt to commit a felony or misdemeanour is an offence punishable by the law of England under sec. 41, A.A.

"An attempt to commit a crime is an act done with intent to commit that crime, which immediately and directly tends to its commission, and which, if completed, would be the crime itself.

"Whether the non-completion of the act may arise from interruption, from some unexpected obstacle, or from the voluntary desistance of the person attempting, it is nevertheless an attempt, provided there is a possibility of its completion.

"Soliciting or inducing, or an endeavour to induce, another person to commit a crime is an attempt to commit that crime. Mere intention, or an act manifesting that intention, is not an attempt.

"It is to be noted that attempts to commit the various military offences specifically provided for in the A.A. are not offences, unless where—as in the case of attempting to desert—they are so declared, or where the crimes specified are also offences under the ordinary law of England."—*J. C. O'Dowd, C.B.\**  
 "Hints to Courts-martial."

**The Army Act** is divided into five parts:—

**Part I. Discipline.**—Under this head are included all offences for which soldiers in their military capacity are punishable. This part authorises the formation of military courts, and legislates for the carrying out of their sentences: gives power to the Sovereign to make Articles of War and Rules of Procedure. Articles of War are applicable only to the soldier, they do not extend to the civilian. The limitations and restrictions under which they are permitted are so stringent as to render it highly improbable that this power will ever again be used. Herein also the Sovereign is granted power to make regulations for command in the army, but it is stated—"That command shall not be given to any person over a person superior in rank to

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\* I prefer, in many instances, quotations from the writings of the Dy. Judge-Advocate-General, where they bear directly on a subject, rather than those from the Official Manual of Military Law, to which every officer has access.

himself." This proviso obliges an officer in regimental or other staff employment, irrespective of the position his appointment gives him, to sign commands "By order" of his superior officer. The definition of this expression is stated as—"I convey to you these instructions 'by order' of one you are bound to obey." Where the officer signing happens himself to be at the head of an administration on the staff of the army, signing in this way is as a general rule unnecessary, such appointments being held by officers of superior rank.

**Rules of Procedure.**—The Sovereign is empowered to make R.P. subject to the provisions of the A.A., to be signified under the hand of a Secretary of State, for the formation of military courts, trial of offenders, and the carrying into effect sentences. R.P. must be laid before Parliament as soon as practicable after they are made. Although judicial notice must be taken of these rules, they have not the same force as an Act of Parliament. A careful distinction is here required in administering the law. Departure from a R.P. in bringing a transgressor to justice may be rectified, and the sentence hold good, provided the accused person has not been prejudiced in his defence or otherwise wronged thereby, but non-compliance with the Act of Parliament renders proceedings *null* and *void*. In this latter case the prisoner occupies the position of one who has never been brought to trial, and fresh proceedings can be taken against him for the original offence. See **Second Trials**, p. 125.

**Military Offences**, Part I., comprises within its 41 secs. all the offences for which a person subject to military law can be brought to trial, and also such civil crimes and offences as are triable by military courts of law. All that concerns the authority necessary for the exercise of military command and the enforced maintenance of discipline are contained within this part of the Act.

**Part II. Enlistment.**—Herein are stated those laws relating to enlistment which concern both the soldier and the civilian; the terms upon which a man enlists, the obligation he enters into and his liabilities, how his service is reckoned, transfer, re-engagement, prolongation of service and discharge arranged, may be found here. This and the following part intimately concern the administration of the army, but offences against enlistment are dealt with in Part I. as matters concerning discipline.

**Part III. Billeting and Impressment of Carriage.**—This part only comes in force when troops are moving in the United Kingdom. The civil population are on certain occasions obliged to supply food and carriage to the troops at special rates fixed annually.

**Part IV. General Provisions.**—Here are given details with respect to military courts and their jurisdiction, military prisons, pay, the adjustment of civil and military law, etc.

**Part V. Application of the Act.**—Definitions of the various terms used in the Act are here given, and of its jurisdiction with respect to persons and places.

**The Army Annual Act** states that it is illegal to keep up a standing army without the consent of Parliament, decides the necessity for a military code, fixes the numbers of the army for the year, settles prices connected with billeting, and brings in force amendments of the A.A. By reason of this annual amendment, military law has a great advantage over civil law with its numerous statutes, yet the constantly recurring changes going on within the law are not of so marked a benefit to those who are responsible for regimental administration.

**Army Orders.**—Under the re-organization of the War Office and Financial Department, these orders are issued under the authority of the C.-in-C. They are issued monthly; they amend from time to time the Queen's Regulations and Orders for the Army; they deal with questions of discipline, interior economy and general efficiency, as well as matters in connection with the expenditure of money. In these orders are embodied all matters formerly promulgated in *General Orders* and *Army Circulars*, which are no longer published; the latter were issued by the Secretary of State for War, and dealt with finance.

**Royal Warrants** are published when deemed necessary by the Crown, with the advice of the Secretary of State for War; generally they revise, cancel, consolidate, or amend pre-existing warrants. They deal with matters beyond the provisions of A.Os. Be it observed that any pay beyond the ordinary pay of an officer, being of the nature of a gratuity or reward, is left entirely at the disposal of the R.W., and in case of a difference of opinion as to the application of any article in a warrant, the Secretary of State for War is the sole administrator and interpreter of the warrant.

**Orders in Council** are issued by the Crown under the advice of the Privy Council; they affect both the land and sea forces.

**Persons subject to Military Law.**—All officers and soldiers of the regular forces on the active list, and officers not on the active list, when employed on military service under the orders of an officer of the regular forces. Officers of the permanent staff of any of the auxiliary forces, and all officers of the militia, officers of the yeomanry and volunteers when in command of men who are subject to military law. Any officer of the yeomanry or volunteers during the time when *with his own consent* he is attached to or doing duty with any body of regular troops, is for the time being subject to military law; this occurs when the yeomanry or volunteers are brigaded with the regular forces, and the same applies to N.C.Os. and men, army or militia reserve when called out either permanently or temporarily. *Pensioners* when employed in military service under an officer of the regular forces. *Indian forces*, European officers,

and British-born subjects. Natives of India are under Indian military law, but a court can be convened under the A.A. for their trial. *Colonial forces* maintained out of the Imperial revenues, and under an officer of the regular forces, are subject to military law, so are also civilians attached to or accompanying a force on active service either in an official capacity or as camp followers.

Officers of the Army Medical Reserve belong to the regular forces as well as to the auxiliary forces; they occupy an undefined position.

**A War Correspondent**, who accompanies an army in the field, holds from the G.O.C. a *pass* which authorises him to be treated as an officer, and consequently liable to trial by general court-martial.

**A Camp Follower**, who holds a *pass* in a similar way, becomes liable to trial by court-martial as a soldier, but cannot be punished by a C.O.

For further particulars as to who are treated as persons subject to military law as officers and as soldiers, see secs. 175, 176, A.A.

All persons subject to military law, their wives and families, including step-children up to 16 years of age, and the servants of officers, are entitled to medical attendance and to receive medicine out of the public stock free of cost.

The A.A. recognises the right of the Admiralty to make Articles of War for the Royal Marines. The Army Annual Act states that whenever the marine forces are not subject to the law relating to the government of H.M.'s forces by sea, they come under the provisions of the A.A., as is the case when serving on shore or on board ships other than those in commission.

**The Army Reserve.**—The number of the reserve forces is not above 55,000 men divided into two classes.

*Class I.* consists of men who have served not less than three years in the regular army. They receive 9*l.* a year, made up of 4*d.* reserve pay and 2*d.* deferred pay daily. They are liable to be called on to serve out of the United Kingdom. The total number of this reserve at present is 53,000—cavalry, 3,600; artillery, 4,700; infantry, 37,000; engineers, 1,300; M.S.C., 1,000; other services, 5,400.

*Class II.* consists of men who have served their full period of first term of enlistment, 12 years; not to exceed 30,000 men, at present not above 2,000. They are liable to serve in the United Kingdom only. The reserves may be called out for 12 days or 20 drills annually. Men absent from training are liable to punishment as deserters.

The annual draft from the army into civil life from all causes is about 24,000; of these 10,600 are transferred to the reserves. On account of our present system of short service and reserves,



the influence of the army on the community at large is greater than was the case in former years; moreover the army is a far more extensive training ground in many ways than was the case formerly, consequently responsibilities in connection with the service are vastly increased.

**The Auxiliary Forces** consist of militia, yeomanry and volunteers.

**The Militia** are enlisted for six years, and receive 6*l.* bounty, paid 1*l.* at each annual training: a militiaman receives a free kit on joining, and boots, socks, and shirts annually afterwards. The force consists of 120,000 men—England 80,000 men, Ireland 30,000, Scotland 10,000. The militia are said to be “embodied” when called out by royal proclamation; this differs from being called up for training. *The militia reserve* consists of men over 19 years of age who have served two trainings. They enlist in the reserves for six years; for this they receive a bounty of 1*l.*, and these re-enrolled men get at each annual training a gratuity of 10*s.* in addition to the 1*l.* The total number of this reserve is limited to one-fourth of the entire militia force.

**Indian Military Law** (A.A.—secs. 175, 176, and 180) means Articles of War embodied in an Act of the East Indian Government, and affects all officers and soldiers, natives of India, wherever serving, *whether attached to European troops or not*, all camp followers of an army on active service, and generally all persons belonging to the Indian army are subject to it under certain limitations.

European officers and persons of British birth are only subject to the A.A.

A Governor within his Presidency can suspend proceedings of a court-martial on an officer or soldier of H.M.’s Indian forces. A court-martial may sentence an officer of the Indian Staff Corps to forfeit all or part of his army or staff service or both.

An officer, not a native of India, must be tried by a court consisting of European officers only.

The A.A. applies to hospital apprentices as if they were warrant officers not holding honorary commissions.

**Classification of Military Offences.**—The following from the Official Manual of Military Law, as well as showing the principles of classification adopted in our military code, is also useful as a general index which will facilitate references to the sections embraced under each heading.

“The principle adopted in classifying the strictly military offences is that of grouping together offences of a similar character, and ranging the various groups as between themselves in a manner intended to impress the soldier with their relative military importance. For example, the Act begins with *Offences in respect of Military Service* (secs. 4–6), and these are followed by the heading *Mutiny and Insubordination* (secs. 7–11),

by way of showing that gross misbehaviour in the field, mutiny, and insubordination rank first among military crimes. The above headings are followed by—

*Desertion, Fraudulent Enlistment, and Absence without Leave* (secs. 12-15);

*Disgraceful Conduct* (secs. 16-18);

*Drunkenness* (sec. 19);

*Offences in relation to Prisoners* (secs. 20-22);

*Offences in relation to Property* (secs. 23, 24);

*Offences in relation to False Documents and Statements* (secs. 25-27);

*Offences in relation to Courts-martial* (secs. 28, 29);

*Offences in relation to Billeting* (sec. 30);

*Offences in relation to Impressment of Carriages and their Attendants* (sec. 31);

*Offences in relation to Enlistment* (secs. 32-34);

*Miscellaneous Military Offences* (secs. 35-40);

Lastly come *Offences Punishable by Ordinary Law* (sec. 41) which can also be tried by court-martial."

**Framing of Sections.**—The wording of each sec. of the A.A. is alike thus:—"Every person subject to military law who commits any of the following offences, that is to say"—here are stated the offences to which the sec. applies—"Shall on conviction by court-martial be liable to suffer"—Then the maximum punishment for the offence is stated, which in no case can be exceeded, although—"Such less punishment as is in this Act mentioned"—can be given. A form of punishment not mentioned in the Act is an illegal punishment; yet if an illegal punishment be awarded by a court-martial, a legal one may be substituted for it, and the sentence thus amended hold good. See R.P., p. 6.

### **Charge Sheet, Charge, and Framing of Charges.**—

"A charge sheet contains the whole issue or issues to be tried by a court-martial at one time.

"A charge means an accusation contained in a charge sheet that a person amenable to military law has been guilty of an offence.

"A charge sheet may contain one charge or several charges."—*M.L.*

Every charge of a military offence against a person must state that he is an officer or soldier of the regular forces, or otherwise how employed on military service, in order to show that his military status was such, at the time of committing the offence of which he is charged, as to render him subject to military law.

**Contents of Charge.**—"Each charge should state one offence only, and in no case should an offence be described in the alternative in the same charge.



“ Each charge should be divided into two parts—

- (1) The statement of the *offence*; and,
- (2) The statement of the *particulars* of the act, neglect, or omission constituting the offence.

“ The offence should be stated, if not a civil offence, in the words of the A.A., 1881, and if a civil offence, in such words as sufficiently describe that offence, but not necessarily in technical words.

“ The *particulars* should state such circumstances respecting the alleged offence as will enable the accused to know what act, neglect, or omission is intended to be proved against him as such offence.

“ The *particulars* in one charge may be framed wholly or partly by a reference to the particulars in another charge, and in that case so much of the latter particulars as is so referred to shall be deemed to form part of the first-mentioned charge as well as of the other charge.

“ Where it is intended to prove any facts in respect of which any deduction from ordinary pay can be awarded as a consequence of the offence charged, the *particulars* should state those facts.”—*M.L.*

### **Illustration of a Charge Sheet, from the Official Manual.**

*Description of Prisoner.*—The prisoner, No. 153, Private John Smith, 69th Regiment, a soldier of the regular forces, is charged with—

*First Charge.*—First: *Using threatening language to his superior officer*—in that, at Topsham Barracks, Exeter, on the 20th of June, 1880, he said to Sergeant William Robinson, his superior officer, “ I will punch your head,” or words to that effect.

*Second Charge.*—Secondly: *Resisting an escort whose duty it was to have him in charge*—in that, at the place and on the day mentioned in the first charge, he kicked Drummer James Burn, of the 69th Regiment, who was taking him into confinement, and thereby damaged a watch and chain of the said James Burn to the amount of five shillings.

When there is such a divergence between the head of charge and the statement of the particulars that each in substance discloses a different offence the charge is bad; but the incidental mention of a separate offence in the particulars would not of itself invalidate the charge.

Where the head of charge states an offence, but the statement of particulars discloses no offence, the charge is not invalid, if, taken as a whole, it informs the prisoner of the allegations he is called upon to meet, and the offence for which he is arraigned.

**The Statement of Particulars** should specify all the ingredients necessary to constitute the offence: for example, if the charge is under sec. 9 (2), for disobeying a lawful command,

the "particulars" must state the command, and show that it was given by a superior officer, and also how the prisoner disobeyed the command.

*Place.*—The "particulars" should always give a general description of the place where the offence was committed, such as the station or town or the "line of march." At or near, between, etc., must never be used if the exact place is the essence of the offence.

*Date or Time.*—"The 'particulars' should always state the date at which the offence was committed. If the exact date or time is unknown, the offence may be stated as having been committed 'on or about' a particular day or time. This must never be done where the time is of the essence of the offence, as, for example, the case of absence without leave or being drunk on a post.

"In some cases the offence may be stated with most accuracy as having been committed between two days or between two times, as, for instance, in the case of absence without leave, or of quitting a post; in other cases 'between' may be used in consequence of the exact day or exact time not being known.

"The words 'or near' and 'or about' and 'between' should never be used unless it is impossible to express the exact place or time, or the exact place or time is clearly unimportant, or unless the word 'between' is the most accurate expression of the place or time."

**Alternative Charges.**—"Although the description of an offence in the alternative in the same charge would make the charge bad, it does not therefore follow that the word 'or' is never to appear in the charge. For instance, a charge under sec. 15 of the Act of 'when in garrison, being found beyond the limits fixed by general orders without a pass or written leave from his C.O.' is a good charge, because in this case he is not charged with one offence or the other, but with a single offence, which is constituted by his having neither a pass nor written leave. If in the charge the words 'beyond the limits fixed by general or garrison orders' were used the charge would be a bad charge, because it might be one offence to be beyond the limits fixed by general orders, and another offence to be beyond the limits fixed by garrison orders."

"Where the officer framing the charge is doubtful whether the offence so capable of being proved by legal evidence is more accurately described by one word, or expression, or by another, he may frame two or more alternative charges, each charge containing one of the words or expressions which appear to the officer to be applicable to the facts as capable of proof. See **Cognate Offences.**

"In no case must the charge couple with the word 'or' two or more of the words or expressions bracketed together in a section.

“For example, a man may be charged with making away with his arms, ammunition, *and* necessaries; but a charge for making away with his arms, ammunition, *or* necessaries will be a bad charge.

“A man should not be charged, however, with making away with by pawning *and* selling his arms and necessaries, as in such case he is charged with at least two distinct offences, which ought to be included in at least two distinct charges, one for making away with by pawning his arms and necessaries, the other for making away with by selling his arms and necessaries.

“In the former example the offence is the sale of some article which he is prohibited from selling, and is the same offence although committed in respect of different articles. In the second example there are two distinct offences of making away with his articles—(a) by pawning, (b) by selling—although committed in respect of the same objects—arms and necessaries.

“A second charge may be added to the charge sheet as an alternative to the first charge in those cases where it is doubtful whether the offence committed by the person amounted to one charge or to the other.

“In certain cases, such as theft, embezzlement, fraudulent enlistment, separate charges for separate instances of the same offence may be inserted in the same charge sheet.

“The old practice of inserting one charge with several instances should be abandoned. Each separate act of the prisoner which is an offence should, as a rule, form a separate charge, and not be stated as an instance. In case of doubt the best test is whether the prisoner can plead guilty or not guilty to the charge without stating any exceptions.”

The foregoing, gathered from the Manual of Military Law, where the important subject of the framing of charges under the Act is treated of at length, may be found useful. According to the R.P. the *Convening Officer*, that is, the officer who orders the court to assemble, is responsible for the correctness of the charge, but practically it is the officer commanding a regiment or a division or detachment of the Medical Staff Corps, who will be obliged to make out the charge, and this can only be done correctly or with any certainty by those who have a knowledge of the law which states the crimes to which the charges refer. The object of having different charge sheets, and of dealing separately with evidence unconnected intimately with the same transaction, is to avoid confusion and simplify proceedings. Courts-martial are not well adapted to deal with complicated cases, on account of the absence of legal training of the members, who combine both the functions of judge and jury.

**Sections of the Army Act.**—The following epitome of those secs. of the Act which relate to discipline, and some explanations of the meaning of terms used in stating offences,

with a short reference to the correct application of the various secs., may prove useful. Secs. 1, 2 and 3 are preliminary; they refer to the title of the Act, the mode of bringing it into force, and its division into parts.

### Section 4.

**Offences in respect of Active Service** are stated in secs. 4, 5, and 6. This sec. 4 deals with offences in relation to the enemy, and are of the most serious nature it is possible for a soldier to commit, rendering a person on conviction liable to suffer death. Within this sec., and consequently under the forms of charges in the R.P., a number of terms occur, the substance or legal meaning of which had better be stated briefly, as they may become the essence of a charge.

The person *in charge*, it is stated, who *shamefully* abandons or gives up a garrison, post, or place, or the person who *treacherously* corresponds with, gives intelligence to, or, through *cowardice*, sends a flag of truce to the enemy, or assists him with arms, ammunition, or supplies (including water), or *knowingly* harbours or protects an enemy not being a prisoner, or *misbehaves* or induces others to misbehave in *such a manner as to show cowardice*, is liable to be brought to trial under this sec.

“It is necessary to show that the act was done ‘shamefully,’ that is, by a positive and disgraceful dereliction of duty, and not merely through negligence, misapprehension, or error of judgment. So ‘treacherously’ and ‘knowingly,’ or with a full knowledge of the meaning and effect of the act, is the essence of the offence, and some circumstance must be proved from which the treachery or deliberate intention is to be inferred beyond reasonable doubt. ‘Military misbehaviour’ may be inferred in the sense that the accused, from an unsoldierlike regard for his personal safety in the presence of the enemy, failed in respect of some direct and feasible duty.”—*O’Dowd*.

### Section 5.

The offences specified in this sec. are incidental to active service; they are very comprehensive, and extend to the use of words calculated to create alarm or despondency among the troops. The two first sub-secs. are:—

- (1.) Without orders from his superior officer leaves the ranks, in order to secure prisoners or horses, or on pretence of taking wounded men to the rear; or,
- (2.) Without orders from his superior officer wilfully destroys or damages any property.

**Active Service.**—The expression active service, as applied to a person subject to military law, means whenever he is



attached to or forms part of a force which is engaged in military operations in a country or place wholly or partly occupied by an enemy, or is in military occupation of any foreign country.

Offences committed by persons under the above conditions are not necessarily charged against the accused as *on active service*. At Suakin, in 1885, after the British forces were ordered to act on the defensive, although the enemy were in a state of active hostility, the trial of offenders as on active service was dispensed with. In Egypt also the more serious charge of having committed an offence while on active service is omitted, yet the army is in military occupation of a foreign country. A convening officer or G.O.C., who directs that the full force of the law be held in abeyance in matters of discipline, does not thus affect the provisions of Article 435 R.W. relative to charge pay of the S.M.O. of an army in the field—a point on which I experienced much difficulty in obtaining a favourable decision.

As charge sheets afford the best practical illustration of the mode of stating a charge, a few specimen sheets will be given under the different sections.

#### CHARGE SHEET.

**Sec. 5 (1):**—The prisoner, No. —, Private —, — Battalion, — Regiment, a soldier of the regular forces, is charged with, *When on active service, without orders from his superior officer, leaving the ranks on pretence of taking wounded men to the rear*, in that he, at —, on —, when in the ranks, and during an attack upon —, without orders from his superior officer, on pretence of taking to the rear Lieutenant —, who was wounded, left the ranks.

#### Section 6.

This sec. includes offences which are more severely punishable *on active service than at other times*.

The offence of shamefully abandoning a post under sec. 4 applies only to the C.O., but under this sec. it is used with respect to the individual posted or placed as a sentry. In determining what in any particular case is a “*post*,” the court will use their military knowledge.

**Leaving a Post.**—An orderly M.S.C. on duty in a corridor, a ward, or in special charge of a patient is *posted*, and punishable under sec. 6 (b) for an offence as follows:—*Without orders from his superior officer, leaving his guard, picquet, patrol or post*. If drunk on any such duty, it would be an aggravated case of drunkenness. If absent from his post and drunk, the charge should be for *leaving his post*, and not for being drunk on duty; but under circumstances where these duties have a continuous operation, and the posting and relief are not strictly carried out, the position of an orderly in such a case is analogous to that of a “stableman.” See Q.R., sec. vi., para. 77.

**Safeguard.**—A N.C.O. on gate duty is acting *as* a sentinel and liable to be punished for an offence as if he were one, but he is not a sentinel. A sentinel is one of a safeguard posted over houses, persons, or property in time of war. Forcing a safeguard is a serious military offence, as it shows a want of proper respect for the authority ordering the guard. *See* sec. 37, A.A.

**Authority among Soldiers.**—“A party of soldiers escorting a prisoner is a *guard*. A private soldier, while temporarily in command of a guard or party, is the superior officer of the other privates, over whom he is placed as if he were their superior officer. A lance corporal, while acting as orderly corporal, is the superior officer of all other lance corporals.”

This ruling is of more importance than at first sight it might appear. It confers military authority in the rank and file of the army over one another—a lance corporal is a private. But this does not touch the question of command in the commissioned rank or non-commissioned rank, which by analogy, if not by custom and usage as regards seniority, is regulated in accordance with the higher rank. Thus, irrespective of grade or class, an orderly on duty is the superior of all other orderlies within the sphere of his duties, as if he were their superior officer.

Among soldiers of the M.S.C., where an essentially military duty devolves on them, such as the keeping of order in a barrack room would be, the soldier for the longest time serving on his military engagement must be deemed the oldest soldier, irrespective of his grade as an orderly. In case of an essentially departmental duty, responsibility would rest among them according to the class to which they belonged. On this principle, where two cooks of equal rank are employed in a kitchen, the one that has the highest qualification will invariably be placed in charge.

**Occupying a Post.**—Any irregularity in posting a sentry does not exonerate the sentry, for if he posts himself he is held to be liable for all duties connected with the assumed position, as if posted in the regular way by a N.C.O. *See* p. 74.

This ruling is also very important when extended and applied to all military duties. Thus if an officer or soldier takes charge of any *post, place, or thing*, he becomes liable for every duty in connection with the position he has undertaken. If part of the duties laid down by regulation or promulgated in orders as appertaining to the assumed office are not fulfilled, it is no valid excuse (under ordinary circumstances) to say, that the place or thing taken in charge was not in the first instance properly handed over. The principle involved in this ruling is also material in administration whenever the fixing of responsibility is necessary. A decision given on this basis, but subject to variations, will be in accordance with the correct rendering of the law. *See* secs. 17, 24, A.A.



## Sections 7 to 10.

**Mutiny and Insubordination.**—This is the next group of crimes after those in relation to military service.

**Sec. 7—Mutiny.**—The term mutiny implies collective *insubordination*: one man cannot mutiny; there must be a combination of two or more persons actively or passively to resist or disobey legal authority. Evidence must show that they were acting in concert.—“If they so conduct themselves as to manifest a common purpose in the matter, each one of a body of men not marching or not coming from their barrack-room when duly ordered are guilty of mutiny.”—It is provided, that a soldier present and not endeavouring to suppress a mutiny or sedition is as liable to be punished as if he joined in.

**Sedition.**—The crime of sedition is included in this sec.; it is the same crime as in the ordinary criminal law.—“Sedition in military life may be taken as meaning a proceeding falling short of actual mutiny in respect of direct resistance or disobedience, but of a mutinous tendency, and it includes any tumultuous or disorderly assemblage, demonstration, or other manifestation for the purpose of subverting or interfering with superior authority.

“For instance, each one of a number of men going in a body to a superior in a menacing manner, in order to induce him to release a prisoner or mitigate his punishment, joins in a sedition.”—*O’Dowd*.

**Sec. 8—Striking or Threatening a Superior Officer.**—This sec. relates to offences against the person of a superior officer, framed to protect superiors from deliberate violence or serious insult from those over whom they are placed in the interests of discipline.

The forms of charges under this sec. are:—

- (1.)  $\left\{ \begin{array}{l} \text{Striking} \\ \text{Using violence to} \\ \text{Offering violence to} \end{array} \right\}$  his superior officer, being in the execution of his office.
- (2a.) [When on active service,]  $\left\{ \begin{array}{l} \text{striking} \\ \text{using violence to} \\ \text{offering violence to} \end{array} \right\}$  his superior officer.
- (2b.) [When on active service,] using  $\left\{ \begin{array}{l} \text{threatening} \\ \text{insubordinate} \end{array} \right\}$  language to his superior officer.

Sub.-sec. (2) does not necessarily apply to active service.

**Execution of his Office.**—This expression is difficult accurately to define, so the interpretation of these words is left to the military knowledge of the court.

An officer in plain clothes may be in the execution of his office. Officers and N.C.Os. in quarters are in the execution of their office.

A N.C.O. ordering a disorderly soldier to return to barracks is in the execution of his office. On the other hand, should a soldier

not be disorderly or conducting himself to the prejudice of good order and military discipline, a N.C.O. might be acting beyond the sphere of his duty by ordering him to barracks.—“A corporal asleep in the barrack room of which he was in charge, would probably be held to be within the protection of this sec.”

Under ordinary circumstances, in the vicinity of barracks or camp, an officer or N.C.O. is in the execution of his office.

Sub.-sec. (1.) Charges under this head may be framed without the addition of “in the execution of his office.” The evidence will indicate to the court the position of the superior officer in this matter.

**Striking his Superior Officer.**—Respecting this offence, the manner in which the blow was struck, or weapon used, or missile thrown, are not the essence of the charge, and the court, by a *special finding*, can omit the statement in the charge relative to these matters in accordance with the evidence produced.

A private aiming a blow at one N.C.O. and striking another by accident, is guilty of the offence of striking his superior officer. Although the one struck was not the one named in the charge, a correction can be made in the finding and the conviction hold good.

A private attempting to strike another private, but accidentally striking a superior instead, should not be charged under this sec., although he might be brought to trial under sec. 40.

Should it appear that the prisoner was not aware that the person he struck was his superior officer, he is entitled to be acquitted of the charge. The intention being an essential part of the offence, it must be proved beyond all reasonable doubt.

**Offer of Violence.**—An offer of violence is an attempt at violence, *i.e.*, some act which if complete would constitute violence. The accused must be in a position capable of carrying into execution the full offence. Shaking his fist out of a window at his superior, and threatening at the same time to punch his head, is not an offer of violence. Presenting an unloaded fire-arm at a superior, and threatening to thus shoot him, is not offering violence. Attempting to strike another within reach is offering violence to that person. Aiming an unloaded gun at a person within range is an *assault* on the person aimed at, if he believed it was loaded at the time it was pointed at him. See p. 65.

**Threatening or Insubordinate Language.**—“The omission in the charge of the particular language, or its substance described as ‘insubordinate’ or ‘threatening,’ renders the charge bad from vagueness, the prisoner not being informed what he has to answer to, and being thereby prejudiced as regards such defence as he might have to offer.”—*O’Dowd*.

Where the charge is for *threatening or insubordinate language*, to justify a conviction it is necessary to prove that the exact

words specified in the particulars of the charge, or their substance, were addressed by the prisoner to his superior, or with the intention that he should hear them.

*The words must be used with an insubordinate intent*, which must reasonably appear from the nature of the words themselves, or the insulting or disrespectful tone, manner, or circumstances connected with their expression. In this latter case opinion may be taken as evidence.

*Improper language*, not amounting to insubordinate language or expressions, used of a superior officer will form charges under sec. 40.

“Military offences, unlike civil offences, frequently consist in words, *e.g.*, the use of insubordinate language. As a general principle, the improper use of words should not be treated with the same severity as offences consisting in acts. Further, great care should be taken in discriminating between mere angry or irritable expressions, and words indicating a deliberate intention to be insubordinate or to resist lawful authority. A soldier frequently uses violent language, which is a mere outburst of momentary irritation or excitement, without at all intending to be insubordinate. Again, allowance must be made for the coarse expressions which a man of inferior education will often use as a mere expletive. Such expressions may be insubordinate if used to a commissioned officer, and not so when used to a N.C.O., or when used under one set of circumstances, and not when used under another. Language therefore should always be construed with due regard to all surrounding circumstances; and the intention of the man in using it should be carefully considered, before it is held to constitute the grave offence of using threatening or insubordinate language to a superior officer.”—*M.L.*, ch. V.

#### CHARGE SHEETS.

**Sec. 8 (1):**—The prisoner, No. —, Private —, — Battalion, — Regiment, a soldier of the regular forces, is charged with, *Striking his superior officer, being in the execution of his office*, in that he, at —, on —, struck with his fist in the face Corporal —, — Battalion, — Regiment, who was at the time in command of an escort taking prisoners to the guard-room.

**Sec. 8 (2a):**—The prisoner, No. —, Private —, etc., is charged with, [*When on active service*] *offering violence to his superior officer*, in that he, at —, on —, when checked by Corporal —, — Battalion, — Regiment, for swearing in his barrack-room, attempted to strike the said corporal.

**Sec. 8 (2b):**—The prisoner, No. —, Private —, etc., is charged with, [*When on active service*] *using threatening language to his superior officer*, in that he, at —, on —, after having been awarded a punishment by his commanding officer, said to Sergeant —, — Battalion, — Regiment, “I’ll be revenged on you for this, yet.”



As *threatening language must be insubordinate*, the latter term had better be used in many instances in framing charges. Where the use of any such language accompanies violence, or an attempt at violence, it had better be omitted, it being merely incidental to the more serious offence. The greater the distance in rank between the inferior and superior, the greater the offence committed. The name and rank of the superior must be stated in the charge.

**Sec. 9—Disobedience to a Command given by a Superior Officer.**—This contains two sub-secs., which relate to different degrees of the same offence.

(1.) Disobeying, in such manner as to show a wilful defiance of authority, a lawful command given personally by his superior officer in the execution of his office.

(2.) [When on active service] disobeying a lawful command given by his superior officer.

Sub-sec. (1) states the very serious offence where the actions of the offender show a wilful and deliberate defiance or resistance of his superior officer's authority; the command in this case *must be given personally*. (2) Relates to the less grave offence. Here the command *may be conveyed* from his superior officer, and it is not necessary to positively refuse to obey; under varying circumstances the offence may show a departure from that prompt, immediate, and unhesitating obedience which is the standard of the service. See **Illustration of a Charge Sheet**.

“The disobedience must be immediate or proximate to the command, and actual non-compliance must be proved. A man who says ‘I will not do it,’ does not necessarily disobey. A man who when ordered to do a duty at a future time says, ‘I will not do it,’ does not thereby commit an offence under this sec., though he may be liable under sec. 8 (2).

“If the command is of a prospective nature, a man, before he can be guilty of disobedience, must have had an opportunity to obey the command. For example, if the command is to turn out for parade in half an hour, then, until the expiration of that time, no offence of disobedience to a lawful command can be committed. If the soldier on receiving the command makes a reply implying an intention to refuse, and is put in the guard-room before the end of the half hour, he may be charged under sec. 8 with using insubordinate language, or under sec. 40 with using improper language, but not with the offence of disobedience to a lawful command.”—*M.L.*

**Lawful Command.**—The Medical Staff exercise command over all soldiers in hospital; and as the entire army, almost without exception, pass through military hospitals, on this account alone, if for no other, it is necessary for those in charge of hospitals to have as thorough a conception as possible of what a lawful command is.

“*Lawful Command* means not only a command which is not contrary to the ordinary civil law, but one which is justified by military law; in other words, a lawful military command, whether to do, or not to do, or to desist from doing, a particular act. A superior officer has at any time a right to give a command, for the purpose of the maintenance of good order, or the suppression of a disturbance, or the execution of any military duty or regulation, or for any purpose connected with the amusements and welfare of a regiment, or other generally accepted details of military life. But a superior officer has no right to take advantage of his military rank to give a command which does not relate to military duty or usages, or which has for its sole object the attainment of some private end. Such a command, though it may not be unlawful, is not such a lawful command as will make disobedience to it criminal. In any case of doubt, the military knowledge and experience of officers will enable them to decide on the lawfulness or otherwise of the command.

“**The Command must be one relating to Military Duty**, that is to say, the disobedience of it must tend to impede, delay, or prevent a military proceeding. Thus a command given by an officer to his soldier-servant to perform some domestic office not relating to military duty is not a command within the meaning of this sec. A soldier who refuses to take a letter relating to private theatricals upon the order of a N.C.O. does not disobey a lawful command.”

The above quotations are from the Manual of Military Law. On this point O'Dowd says—“One of the nearest illustrations I know of is the case of a soldier told by an officer to fetch his horse from the stable. If the horse were his charger, and he wanted it for military duty, the soldier disobeying the order would fall within the meaning of this sec. If, on the other hand, the officer were in plain clothes or hunting costume, and he wanted his horse for a non-military purpose, it would not be a lawful command, and the soldier would not be amenable to the A.A. for disobedience thereof. In any instance where the military nature of the command is reasonably open to such doubts a conviction should not take place under this section.”

Simmons says—“So long as the orders are not pointedly and decidedly contrary to the known laws of the land or custom of the service, or if, in opposition to these laws, the acts do not tend to an irreparable result, they are lawful, and must be unhesitatingly obeyed.”

These authoritative statements are of importance to the military surgeon, who is responsible for the treatment of his patients in every respect as a military matter. Lawful command should not be confounded with “military command,” which refers to the magisterial power conferred on a C.O. to administer and enforce the law. See pp. 98, 99.



## CHARGE SHEET.

**Sec. 9 (2):**—The prisoner, No. —, Private —, — Battalion, — Regiment, a soldier of the regular forces, is charged with, [*When on active service*] *disobeying a lawful command given by his superior officer*, in that he, at —, on —, did not leave the canteen when ordered to do so by Corporal —, — Battalion, — Regiment.

**Sec. 10—Insubordination.**—This sec. is divided into four sub-secs. as follows:—

- (1.) Being concerned in any quarrel, fray, or disorder, refuses to obey any officer (though of inferior rank) who orders him into arrest, or strikes, or uses or offers violence to any such officer; or,
- (2.) Strikes or uses or offers violence to any person, whether subject to military law or not, in whose custody he is placed, and whether he is or is not his superior officer; or,
- (3.) Resists an escort whose duty it is to apprehend him or to have him in charge; or,
- (4.) Being a soldier, breaks out of barracks, camp, or quarters.

Sub-sec. (2) will apply to assaulting a policeman under such circumstances as stated, or striking, etc., one of the guard. In a charge under sub-sec. (3), it is essential to prove (a) the resistance, which may be either active or passive. A man lying down when physically able to move resists: resistance must be wilful, not due to inability to comply with orders. (b) That the escort guarding the prisoner was duly constituted; military knowledge will determine whether it was the duty of the escort to apprehend the prisoner and have him in charge.

**Breaking out of Barracks.**—Sub-sec. (4). *Breaks out of Barracks, etc.*—“This offence consists in a soldier quitting barracks, etc., at a time when he had no right to do so, either because he was on duty or under punishment, or because of some regulation; and it is immaterial whether the offence was managed by violence, stratagem, disguise, or simply by walking past a sentry unnoticed. The mode in which the act was effected will, however, assist a commanding officer in determining whether to deal with it as a mere breach of discipline under this sub-sec., or to reserve it for trial as amounting to desertion. The particulars of the charge must show that the absence from barracks, etc., was without permission or otherwise unlawful.”

**Breaking out of Camp or Quarters.**—“If the charge be for breaking out of barracks, it must be proved that the prisoner left the confines of the barracks as charged, and so also if the charge is for breaking out of camp. A charge of breaking out of quarters would hold good in the case of a man improperly

leaving one part of a barrack for another where he had no right to be. But leaving a hut, or tent, or barrack-room is not an offence under this sec.”—*M.L.*

*First* prove that the soldier was confined to barracks etc.; *secondly*, that he was absent therefrom; the burden of proof to justify the absence will then rest with the accused.

It is not necessary to state the number of hours the man remained *absent* after *quitting* barracks, as it is not the offence. There is no such crime as attempting to break out of barracks.

#### CHARGE SHEETS.

**Sec. 10** (2):—The prisoner, No. —, Corporal —, — Dragoons, a soldier of the regular forces, is charged with, *Striking a person in whose custody he was placed*, in that he, at —, on —, when placed in the custody of Police Constable —, struck with his waistbelt, on the head, the said police constable.

**Sec. 10** (4):—The prisoner, No. —, Drummer —, etc., is charged with, *Breaking out of barracks*, in that he, at —, on —, broke out of barracks, when confined thereto by order of his commanding officer.

#### Section 11.

**Neglect to obey a General, Garrison, Regimental, Detachment, Guard or other Order.**—“The orders specified in this sec. are standing orders, or orders having a continuous operation. Disobedience of a specific order in the nature of a command should be dealt with under sec. 9, and non-compliance, through forgetfulness or negligence, with an order to do some specific act at a future time under sec. 40.”

It is necessary to prove (a) the existence of the order by its production, or; if it be lost, by secondary evidence; (b) the fact of the neglect must be proved. See **Burden of Proof**, p. 48.

A copy of an order or oral evidence of its existence would be secondary evidence.

**Necessity for Republishing Regulations.**—Non-compliance with, or disobedience to, a Q.R. or an A.O., issued for general information and guidance, unless republished in regimental, departmental, detachment, or some such orders, is not punishable under this sec., but may be dealt with under sec. 40.

The offence of *Concealment of Venereal Disease* will be dealt with under this sec. as neglecting to obey an order. See sec. 18.

It is directed by the Q.R. that secs. from 4 to 44 of the A.A., together with a warning against inducing men to desert or mutiny, “are to be read and published” every three months in regiments and corps. See p. 1.

The Q.R. differ from other regulations issued under authority from the War Office to all concerned, insomuch that they are “Orders for the Army,” while other regulations are issued as instructions for guidance.

**Medical Staff Corps.**—Whenever it is desired to direct the attention of a N.C.O. or private M.S.C. to any regulation relating to his duty which may exist in both parts I. and II. of the Regulations for the Medical Services, reference should be made in local orders to the Corps Regulations, part II., as a copy of these regulations is in the possession of each N.C.O. and man in the corps. Officers and warrant officers must in addition have part I. Thus by special reference to a regulation in the possession of an officer or soldiers, as well as by its promulgation in orders, it can be given the full force of an order.

The duties and responsibilities connected with the framing of orders will be referred to under the head of Administration; however, it may be said here, *the person who issues an order is responsible for it.* As a rule it is the person who issues an order that also enquires into any alleged omission or mistake in the carrying of it out. Naturally he is more or less adverse to a discovery of such an imperfection or inherent defect in his own order as could give rise to any question of this kind in connection with it.

Orders, by reason of their being too exacting, or through ambiguity of expression, or by multiplication will defeat their object, and may tend towards a production of that very numerous class of offence—neglect to obey an order.

Apart from pointing out the specific importance attached to an order, when deemed necessary, the addition of a rider such as—“Any disobedience of the above order will be dealt with in the severest manner possible,” etc., should be avoided. The circumstances are very rare indeed when any such warning or threatening is necessary; each case of disobedience or neglect should be treated on its merits. It is an axiom in both Law and Medicine, that *no two cases are alike in every particular.* To severely punish a good soldier for the “sake of example” is a bad example; nevertheless, by issuing orders as above, a C.O. may become unwittingly compromised or stultify himself by not acting up to his own orders. See pp. 49, 152.

#### CHARGE SHEET.

**Sec. 11:**—The prisoner, No. —, Sergeant —, etc., is charged with, *Neglecting to obey camp orders*, in that he, at —, on —, bathed in the river —, above camp, contrary to a camp order directing all persons to abstain from bathing in that part of the river.

#### Sections 12, 13, 14, & 15

Treat of the same class of offence—**Desertion, Fraudulent Enlistment, and Absence without Leave.**

The number of men who desert annually is over 5,000, but the actual loss to the service from this cause is only about 1,500. The number detected as fraudulent enlistments annually is about 300; of course, many are serving who are not detected.

**Desertion** has been defined as—"Illegal absence from duty without the intention of returning." Therefore, it is necessary to prove the absence without leave, and to bring forward some facts or circumstances justifying the belief that the prisoner did not intend to rejoin the army. But absence without leave for the purpose of avoiding active service and escaping foreign service, are held to be so far "an abandonment of the essential and serious obligations of military service as to constitute desertion." Desertion cannot be judged by the *length of time* a man is absent, or the *distance* he may be from barracks. A man may be only a few hours absent, and yet be found on board a ship bound for a foreign port, in civilian dress, etc.; such facts would show the intention. Again, as regards distance, although inconsiderable, circumstances may point out the intention.

**Fraudulent Enlistment**, an offence allied to desertion, is similarly punishable, except on active service. By re-enlistment the intention to serve is manifest, but if a man fraudulently enlists, intending to evade foreign service, he is liable to be charged with the crime of desertion.

As a rule, a soldier leaving one corps and enlisting in another ought not to be charged with desertion, but with fraudulent enlistment; the fact of his again joining shows, at least at this time, he did not intend abandoning the service.

It is worthy of note that a soldier is always liable to be tried for desertion on *active service*; otherwise, should he subsequently serve for three years continuously in an exemplary manner, *i.e.*, without a regimental entry, he is not liable to trial.

This *exemption* from trial is a different case from one where trial is "*dispensed*" with by competent military authority on confession of the offence.

In case a trial takes place beyond the limit of three years, a charge of making away with or losing, by neglect, his kit, which would otherwise hold good, ought not to be preferred; or in the case of fraudulent enlistment taking place beyond three years previous to the date of trial, the obtaining of a free kit should not be mentioned in the charge, as a sentence of stoppages under these circumstances is illegal.

**Attempting to Desert** is punishable to the same extent as desertion—"To establish an attempt to desert, some act which if completed would constitute desertion must be proved; a mere intention to desert does not amount to an attempt." Here we observe the same principle involved as previously noticed in the offence of *Offering Violence*, although the latter implies a more direct power of execution in the part of the offender.

Suppose a soldier was discovered in civilian clothes going up a ladder placed against the wall of the barrack enclosure, and evidence was forthcoming to show that he expressed a strong dislike to serve further, etc. A charge of attempting to desert, if preferred against him, would probably lead to a conviction.



Here *Absence*, or even breaking out of barracks, would not have occurred; but his actions, coupled with expressions, would indicate the intention necessarily connected with the offence. The evidence should go to point out that had the attempt been successfully carried out, it would have led to the prisoner's desertion.

**Different Acts of Desertion.**—The first offence, second, or any subsequent offences of desertion or fraudulent enlistment are only punishable by imprisonment. A conviction for fraudulent enlistment is regarded as equivalent to a previous instance of desertion, but the absence next before the enlistment, which is the subject of the charge, must not be counted as a previous offence of desertion. It may be assumed that this absence was not desertion, as his action showed no intention to abandon the service.

For trial a man may be deemed to belong to any corps to which he has been appointed as well as his original corps, and he may be tried for any number of desertions at the same time, but in separate charge sheets.

**Persuading or Assisting to Desert.**—The offence of persuading or endeavouring to persuade, procuring or endeavouring to procure, a man to desert are punishable to the same extent as desertion; but assisting or conniving at desertion are lesser offences: such are liable to conviction by a civil court for a term of six months. The desertion or the attempt must have occurred to prove the assistance or connivance.

**Confession of Desertion.**—If a soldier *while serving* confesses desertion, in the absence of evidence he may be ordered to continue serving instead of being taken into custody until proof of his statement is obtained. A record of the confession, signed by the man in the prescribed form, is kept and the matter reported.

If a person *not serving* confesses desertion or absence without leave, provided he gives himself up in uniform, he may be detained in military custody pending enquiry; if not in uniform he must be committed by the civil power before being taken into military custody. A person *apprehended* as a deserter *while not serving*, is taken into civil custody until evidence is forthcoming to dispose of the case; if committed by the magistrate he is handed over to the military. A deserter *discovered while serving* is placed in custody and the matter reported.

On confession of desertion or fraudulent enlistment, when trial is "dispensed" with, the forfeitures and deductions from pay and of service towards pension or discharge which the soldier will suffer, under the order that he shall suffer the same forfeitures and penal deductions as if he had been convicted by court-martial, will be found in the Q.R.

A person falsely representing himself to be a deserter is liable to be punished by three months imprisonment.



**Absence without Leave.**—When a soldier is found to be illegally absent, an inventory of his kit should be taken at once. Absence over 21 days does not constitute desertion, but such absence cannot be dealt with by a C.O. or regimental court-martial without permission. After 21 days absence a court of inquiry should be assembled to ascertain any deficiencies there may be in the man's arms and equipment at the time of illegally absenting himself; also to record the value of unexpired articles of Government property found deficient in his kit; the court should also declare the period of absence as proved in evidence. *See Courts of Inquiry.*

**Furlough.**—A soldier returning from furlough should join before tattoo on the day on which his leave expires; if not, he is considered as absent from that hour, and after the expiration of seven days, if he continues absent without having sent a valid excuse, he should be reported as a deserter.

Every soldier on furlough should leave his address with his C.O.

Leave of absence can only be granted up to seven days on a pass by a C.O.; for a further period a furlough is necessary, which must be granted by the G.O.C., or, in the case of the M.C.S., by the P.M.O.

“In dealing summarily with cases of absence without leave, a C.O. will have regard to the place of the soldier's surrender or apprehension, the circumstances attending his absence, and the period subsequently passed in detention. The absence without leave will be reckoned to terminate when the soldier is taken into custody, and in awarding punishment the C.O. should make allowance for any unusual delay in the disposal of the case.”—*Q.R.* *See Alternative Charges and Cognate Offences.*

### Sections 16, 17 & 18.

**Disgraceful Conduct** of an officer or soldier is dealt with in these secs.

**Sec. 16** states the offence of an officer behaving in a scandalous manner unbecoming the character of an officer and a gentleman. Such conduct must be of a military character or of a social character of so grave a nature as to bring scandal on the service. Such social misconduct as requires reproof or advice from a superior does not come within the provisions of this sec. The acts must be of such a description as to reflect so much discredit upon the service that the offender is unfit to remain in it.

**Secs. 17 & 18.**—Here the offences of **Stealing, Fraudulently Misapplying** and **Embezzling**, or **Wilfully Damaging Goods** are stated.

**Sec. 17.**—To come under sec. 17 these offences must be committed by a person in a *position of trust* in relation to *public or regimental property* when placed under their charge; this charge must be an *official charge connected with the public office held by the accused*.

A soldier posted as sentry over a store or tent in which there is public property could not be charged with the care of the property within the sec., neither could a corporal entrusted by a pay-sergeant for his own convenience with public money, although he might be convicted under sec. 18 (4) as a case of theft, by a person subject to military law, of *regimental or government property*. *Ordinary cases of theft* are dealt with under sec. 41, which provides for the trial of civil offences by court-martial.

**Embezzlement** under the A.A. is committed when one entrusted with public or regimental money or property, and being thus in lawful possession of it, appropriates it to his own use.

**Fraudulently Misapplying.**—An offence of the same nature and closely allied to embezzlement is committed when money or property entrusted to a person for custody or some specific purpose is improperly directed from that purpose, though the accused has not directly converted it to his own use.

In the absence of explanation, from the fact of money not being properly applied, *misappropriation* may be inferred. *Embezzlement*, or the fraudulent conversion of a thing, may be inferred from the fact of a person in whose charge it was not having handed it over according to regulation, or from his being unable to produce it. To constitute the military offence, the money or property must be of the kind mentioned in secs. 17, 18, that is, public or regimental.

With respect to the limited liability of N.C.Os. in cash, see Q.R.

N.C.Os. "are not to be subjected to the risk of loss by having large sums of money placed in their hands." Strictly speaking, they should only be held liable for such sums of public money as they are reasonably supposed to have in hand to enable them to carry on the duties of their appointments—money in charge by virtue of their office.

Canteen money should be paid in daily; 5*l.* is the limit for the caterer of a sergeants' mess to keep in hand.

"A mere error or irregularity in accounts, or a mistaken misapplication of money or goods, does not constitute an offence under this sec. There must be an intent to defraud on the part of the accused, either for the benefit of himself or somebody else, and this must be particularly recollected in the case (for example) of a N.C.O's. accounts getting into confusion through the neglect or carelessness of superiors."—*M.L.*

## CHARGE SHEETS.

**Sec. 17 (a):**—The prisoner, Quartermaster —, M.S., an officer of the regular forces, is charged with, *When charged with the care of public goods, fraudulently misapplying the same*, in that he, at —, on [or about] —, when charged with the care of ten rugs for hospital use, value —, or thereabout, used the said rugs for the purpose of carpeting his quarters and the passage adjacent thereto.

A charge—*When concerned in the distribution of public goods, fraudulently misapplying the same*—might occur under circumstances where they were given away to a person not entitled to receive them, such as letting persons have rations or coal who were not authorised to receive them.

**Sec. 17 (a):**—The prisoner, No. —, Corporal —, Ordnance Store Department, a soldier of the regular forces, is charged with, *When concerned in the care of public goods, stealing the same*, in that he, at —, on [or about] —, when employed in the care of Ordnance Stores, under Captain —, Ordnance Store Department, stole therefrom three revolver pistols, value twenty-eight shillings each.

An orderly *in charge* of a ward might be charged in this way in connection with the theft of ward equipment.

**Sec. 18—Disgraceful Conduct of a Soldier.**—This sec. embraces within it matters of such importance to the M.O., both in a military and medico-legal aspect, that the headings of the charges will be stated, and the subject matter considered, at somewhat greater length than has been done in the foregoing secs. This and sec. 17 are framed on an extension and adaptation of the ordinary criminal law.

Sec. 18 is divided into 5 sub-secs. It states:—

Every soldier who commits any of the following offences, that is to say,—

*Sub-sec. (1.)* Malingers, or feigns or produces disease or infirmity, or

*Sub-sec. (2.)* Wilfully maims or injures himself or any other soldier, whether at the instance of such other soldier or not, with intent thereby to render himself or such other soldier unfit for service, or causes himself to be maimed or injured by any person, with intent thereby to render himself unfit for service; or

*Sub-sec. (3.)* Is wilfully guilty of any misconduct, or wilfully disobeys, whether in hospital or otherwise, any orders, by means of which misconduct or disobedience he produces or aggravates disease or infirmity or delays its cure.

A soldier wilfully guilty of concealing his disease, a bruise, wound, ulcer, etc., provided it is neither a primary or secondary venereal disease, should his disability be aggravated by such misconduct he is punishable under this sub-section. See sec. 11.





sick when he *knew* that he was not sick, and that he feigned or pretended certain symptoms which the M.O. was satisfied did not exist.

**Malingering** is a feigning of disease, but of a more serious nature, implying some deceit, such as the previous application of a ligature, or the taking of some drug, or some other act which though it did not actually produce disease or retard a cure, yet produced the appearance of the disease said to exist.—*M.L.*

Referring to the feigning of disease under this sec., O'Dowd says—"The feigning is difficult to prove, for the medical testimony upon which a charge usually rests cannot absolutely negative the good faith of the prisoner's statement. A man may be so ill as to be unfit for duty, and yet not show signs of it externally. This testimony should therefore be weighed with caution, and be taken as justifying a conviction only when it is strong enough to exclude a reasonable assumption that (1) the disease was real and not feigned, and (2) that the prisoner believed he was sick when he so reported himself.

"It is to be noticed that a charge under (1*b*) discloses an offence, even though the pretence was not made for the purpose of evading duty. Such a charge would probably commend itself in preference to one of malingering, as being more simple and easily proved.

"It has been decided that a man who from voluntary acts, as, for instance, immorality or intemperate habits, involuntarily produces venereal disease, or *delirium tremens*, or any other ailment, is not liable to trial under this sec. The case of *delirium tremens*, however, might be met by a charge under sec. 40. 'Produces' disease must be taken as implying some act done with the deliberate intention of producing such disease. A charge of 'having reported himself sick without sufficient cause, and thereby evaded his duty' was held to be bad in law, inasmuch as it contained no averment that the prisoner knowingly feigned disease; the fact that a man reporting himself sick without sufficient cause may arise from a misapprehension of his condition, by no means implying that deliberate misrepresentation on his part which is necessary to constitute a crime under this sec."

This, taken from the writings of the Deputy Judge-Advocate-General, although non-official, indicates the value likely to be placed on medical evidence in such cases by the court and confirming officer. Before preferring any charge of this nature, care should be taken to ascertain the whole circumstances of the case—motive and intention—and it is well to bear in mind the time which elapsed between the hour at which the soldier reported himself sick and the hour of his physical examination by a M.O. In cases of suspected feigning or malingering, aggravating of disease, or retarding recovery, a M.O. should exercise great care and judgment in his physical examination and personal observation of the soldier. No matter how well satisfied he may be as to the feigning of a disease,



where time and circumstances permit, the value of medical evidence will be increased in the majority of cases by the man being detained for a time under observation.

When a soldier is physically incapacitated through illness from carrying out an order there can be no crime. A similar physical condition will also be a valid excuse for the non-performance of a duty. *See* p. 269.

**Maim.**—To maim is to injure so materially as to render a soldier less fit as a fighting machine, such as the loss of an eye or limb, regardless of personal appearances, or how disfiguring or discomforting the effect of the injury; thus the loss of an ear or the nose is not a maim.

**Stealing, Theft, or Larceny.**—Stealing property other than that named in the sec., or stealing from a civilian, comes under sec. 41. Theft may be defined as the wrongful taking and carrying away anything capable of being stolen without the owner's consent, and with the felonious intention to convert it to one's own use. To constitute theft it is necessary to prove that the property belonged to another, and that it was feloniously taken and carried away. The intention must be to deprive the owner of his property in the thing taken.

The taking and *carrying away* of a thing consists in the moving it, wholly or partially, from the place it originally occupied, in such a manner that the person moving it has for the *moment complete control over it*. Thus to "lift" a thing is to steal it.

In all cases of theft the intention of the offender is a material part of the offence, and this intention must involve a permanent, not a temporary, deprivation of the thing stolen. As a rule a person is not said to steal a thing if previous to the time of converting it to his own use he was lawfully in possession of it: he cannot commit theft by taking and carrying away a thing already in his possession—but this rule does not apply to the possession a domestic servant has over his master's property which he may steal: nor does it apply to cases of merely limited possession of things held for a temporary purpose, as a tankard placed for one to drink from in a tavern. A member of a club or mess may steal from them articles in which he has merely a special property use.

If one soldier steals an article of public property, such as a uniform coat, from another, he can be charged either with stealing public property, or stealing the property of a comrade, as the soldier has a "*special property*" interest, although not an absolute property interest, in the coat.—Sec. 18 (4).

"The improper possession by one soldier of a comrade's necessities, where there is no evidence of theft, is a different question: it is not an offence against the comrade, but is an offence against military rules, and may, irrespectively of any fraudulent intent, be punished under sec. 40."—*M.L.*

**Compounding Offences.**—"A person taking back goods which have been stolen from him, or receiving amends in respect of such goods, on condition that he will not prosecute, is punishable."

#### CHARGE SHEETS.

**Sec. 18 (1a):**—The prisoner, No. —, Private —, — Battalion, — Regiment, a soldier of the regular forces, is charged with, *Malingering*, in that he, at —, on —, [between — and —], with the intention of evading his duties as a soldier, counterfeited dumbness.

**Sec. 18 (1b):**—The prisoner, No. —, Private —, etc., is charged with, *Feigning disease*, in that he, at —, on —, pretended to Surgeon —, that he was suffering violent pains in the head and down his back, whereas he was not so suffering.

**Sec. 18 (2a):**—The prisoner, No. —, Private —, etc., is charged with, *Wilfully maiming himself, with intent thereby to render himself unfit for service*, in that he, at —, on —, when sentry on No. — Post — Guard, by discharging his rifle wilfully blew off the fore and middle fingers of his right hand.

**Sec. 18 (3):**—The prisoner, No. —, Private —, etc., is charged with, *Being wilfully guilty of misconduct, by means of which misconduct he delayed the cure of disease*, in that he, at —, on —, [between — and —], when under medical treatment for syphilitic sores, tampered with the said sores by the secret application of bluestone.

**Sec. 18 (4a):**—The prisoner, No. —, Lance-Corporal —, etc., is charged with, *Embezzling public money*, in that he, at —, on —, when entrusted by Staff-Sergeant Major — with the sum of five shillings, public money, for the purpose of paying for the transmission of five official telegrams, applied the same for his own use.

**Sec. 18 (4b):**—The prisoner, No. —, Private —, etc., is charged with, *First, Stealing goods the property of a comrade*, in that he, in the Cambridge Barracks at Portsmouth, on the 10th July 1883, stole a watch, the property of Charles Williams, a private in the same regiment: Secondly, *Receiving, knowing them to have been stolen, goods the property of a comrade*, in that he, at Portsmouth, at the place and on the day aforesaid, was in possession of a watch stolen from the said Charles Williams, which he knew to have been stolen.

**Sec. 18 (5a):**—The prisoner, No. —, Private —, etc., is charged with, *Such an offence of a fraudulent nature as is mentioned in sub-sec. 5 of sec. 18 of the A.A., 1881*, in that he, at —, on [or about] —, when employed as an assistant in the regimental canteen, with intent to defraud, added water to a cask of ale belonging to the stores of the said canteen.

Offences of a similar nature may occur where the *milk, liquor, or other supplies* received at the hospital have been tampered with.

### Section 19.

**Drunkenness.**—It is a principle in English law that drunkenness is no excuse for crime; as a military offence a case of drunkenness may be either a simple or an aggravated case.

Drunkenness includes intoxication from the effects of opium or any similar drug as well as from alcohol. *See Delirium Tremens*, pp. 76, 89.

An officer, N.C.O., or soldier is liable to be tried by court-martial for a single act of drunkenness whether occurring on or off duty. Although a court has complete jurisdiction in these cases. C.Os. are under severe restrictions with respect to the sending of soldiers for trial. Simple acts of drunkenness are dealt with by fine; the award of a C.O. to impose a fine in these cases is not optional. A N.C.O. is not fined in the same way as a private, but it is optional with his C.O. to apply for a court-martial to try the case or to dispose of it himself.

A court-martial, in addition to, or in substitution for, other punishments, can award a fine not exceeding 1l. The power of fining of a C.O. is limited to 10s. Drunkenness is the only offence for which a soldier can be fined. *See* pp. 89, 104, 116; also sec. 6, A.A.

### Sections 20, 21 & 22.

**Offences in relation to Prisoners.**—This class of offence is of little interest to Medical officers.

**Sec. 20.**—Allowing prisoners to escape, or releasing a prisoner without proper authority.

**Sec. 21.**—Unnecessarily detaining a prisoner in arrest or confinement.

**Sec. 22.**—When in lawful custody, arrest, confinement, or prison, escaping or attempting to escape.

### Sections 23 & 24.

**Offences in Relation to Property.**—This is a class of offence of much interest to Medical officers.

**Sec. 23—Supplies.**—This sec. relates to *taking a fee in respect to provisions brought into barracks or camp, or being interested in the sale or purchase of them, etc.* This entire sec. deals with corrupt practices in connection with supplies.

Under the conditions of contract for supplies to either barracks or hospitals a contractor is liable to be severely punished for *bribing or treating*. It is thus stated in all these contracts:—

“If the contractor, directly or indirectly, by himself or by any one acting in his behalf, shall give, lend, or promise any money,

fee, perquisite, or reward (pecuniary or otherwise) to any person, civil or military, employed, directly or indirectly, under the Secretary of State for War, on account of anything done or omitted to be done by him in connection with this contract; or if he shall offer compensation in lieu of supplies, or purchase and receive back supplies once issued under this agreement, then the said contractor shall forfeit and pay for every such offence a sum not exceeding 200*l.*, and the Secretary of State for War shall be at liberty to sue at law for the recovery of the said penalty, and to forthwith cancel this and any other contracts the said contractor may hold." See pp. 239, 245.

**Sec. 24—Stores.**—This sec. relates to deficiencies in connection with *stores*. Herein are stated the offence of a soldier *making away with*, or being concerned in making away with, or *losing by neglect* his arms, ammunition, equipment, instruments, clothing, regimental necessaries, or illtreating any horse used in the public service, of which he may be in charge, or wilfully injuring any public property—*i.e.*, not through culpable carelessness or accident injuring it.

Secs. 23 and 24 are very important, and worthy of the special attention of those in charge of, and accountable for, supplies, clothing, and equipment.

**Making Away with.**—Here the making away with refers only to the articles specified, and not to money or other goods or valuables. The making away may be by pawning, selling, destruction, or otherwise howsoever. Clothing includes *his* hospital clothing, that is to say, the articles of a *patient's personal equipment* supplied to him, and in which he has a *special property*, but not barrack blankets or furniture, or hospital blankets or bedding, or any other articles which are articles of *ward equipment* used for general purposes, and on inventory in the ward or in charge of the wardmaster.

"Making away with is distinct from theft, as it applies only to goods in the man's possession, and which therefore he cannot steal.

"The offence of making away with is a positive disposal of the articles by some deliberate and specific act, whether of selling, pawning, or otherwise placing them out of military reach. It is in the nature of a fraud. Losing by neglect is, on the other hand, a much more venial offence, both morally and legally, and is indeed only made criminal for obvious military reasons. Hence a charge of 'making away with' should be preferred only upon proof that the prisoner actually sold, pawned, or by some other positive act disposed of his kit, etc.

"A charge of losing by neglect money entrusted to a corporal for the management of a regimental entertainment was held to be bad; so was one with respect to the kit of a recruit, which the prisoner was asked to take care of; so was a charge under the



same head with respect to loss of stores from a tent over which the prisoner was sentry; so also a charge of losing by neglect property of which he had care as mess waiter."—*O'Dowd*. See sec. vi., paras. 78, 79, and 80, Q.R.

**Military Decorations** include medals, clasps, good-conduct badges, or decorations.

**Medals.**—Selling or otherwise making away with a medal is punishable, but losing by neglect is not an offence. No man can be charged for losing by neglect property entrusted to him. In case a soldier is unable to produce his medal, a board will be held to enquire into the cause of its loss. If convicted by C.M. of *designedly making away with a medal*, after five years clear of a regimental entry, if recommended by his C.O., he may receive a new one. If the loss be owing to *neglect*, if recommended by the board, he may get one after two years. If the loss occurred through *accident*, he may be recommended for one at once. The public will only give another medal free if lost accidentally on duty; in all other cases the soldier must bear the cost.

Attempting to sell, or offering for sale, a medal is not a crime under this sec., but may be tried under sec. 40. A medal becomes the private property of a soldier on his discharge.

It is worthy of note that whenever tunics are placed in store, medals are not to be left attached to them; if left attached they may complicate questions involving rights of property.

Wilful acts of injuring or culpable neglect of bedding, blankets, barrack or hospital equipment, or any such stores, might be dealt with under sec. 40, and simple loss of such articles, or damage beyond fair wear and tear, by stoppages or barrack damages, either assessed as personal or general charges.

**Orderly in Charge of Ward.**—In the Regulations for the Medical Services, Part II., under the head of Duties of Privates acting as Ward Orderlies, and in other parts of these regulations, these private soldiers are referred to as the *orderly in charge of the ward*; the designation *orderly doing duty* in the ward would seem preferable.

It is stated that—"they will be responsible to the wardmaster for all bedding and equipment in the ward under their charge, to the correctness of which they have *attested* by their signature" in a book kept for the purpose by the wardmaster. Be it observed, there is no receipt authorised by the regulations, and by obtaining a receipt from a private the N.C.O. in charge of this equipment does not thereby relieve himself of responsibility connected with the property.

It is the wardmaster who holds the ward equipment "on charge" from the steward, who is responsible to the Q.M. or M.O. in charge, who is the *accounting officer* to the War Office and financially responsible for the equipment. A wardmaster under existing regulations has no authority to delegate his



responsibility to a private. The equipment being in his charge or possession, he is not liable to be tried for stealing it, but not so with the orderly said to be "in charge," whose real position with respect to the ward equipment has a relation to that of a sentry placed over property, analogous to that of a domestic servant in a private establishment or a caretaker, but *charge* with respect to stores and supplies involves responsibility of a different description. See secs. 17, 18, A.A.

**Delegation of Duty.**—Whenever an officer, a wardmaster, steward, or other N.C.O. cannot legally delegate his functions to an inferior, he is, in the case of his so doing, responsible for the actions of the latter, and cannot exculpate himself from blame in connection with his charge. The delegation of a duty to one who is officially irresponsible in respect to it is an offence against the law liable to trial under sec. 40.

There would be greatly increased difficulty in the administration of affairs and the fixing of responsibility if it were admitted that the equipment of a hospital or other institution could be portioned out among privates by N.C.Os. Under no circumstances should private soldiers be put in charge of a pack store or any other store.

#### CHARGE SHEETS.

The first is an example of *alternate charges* :—

**Sec. 24 (1)** :—The prisoner, No. —, Private —, etc., is charged with, First, *Making away with by pawning his clothing and regimental necessities*, in that he, at —, on [or about] —, pawned to —, for the sum of five shillings, one pair of ankle boots and two brushes, value —, and one flannel shirt: Secondly, *Losing by neglect his clothing and regimental necessities*, in that he, at the place and on [or about] the day aforesaid, was deficient of the articles of his clothing and regimental necessities specified in the first charge.

*Note.*—If the prisoner sold his clothing, etc., this same charge can be used with the substitution of "selling" for "pawning."

The second charge should only be added where there is any doubt about the proof of the pawning or selling being sufficient.

**Sec. 24 (2)** :—The prisoner, No. —, Private —, etc., is charged with, *Losing by neglect his equipments, clothing, and regimental necessities*, in that he, at —, on [or about] —, was deficient of one waist-belt, value —, one grey serge frock, value —, and two pairs of socks.

#### Section 25.

**Offences in relation to False Documents and Statements.**—Every person subject to military law who commits any of the following offences; that is to say,—

- (1.) In any report, return, muster roll, pay list, certificate, book, route, or other document made or signed by him, or of the contents of which it is his duty to ascertain the accuracy—

- (a) Knowingly makes, or is privy to the making of, any false or fraudulent statement; or
- (b) Knowingly makes, or is privy to the making of, any omission with intent to defraud; or
- (2.) Knowingly, and with intent to defraud or to injure any person, suppresses, defaces, alters, or makes away with any documents which it is his duty to preserve or produce; or
- (3.) Where it is his official duty to make a declaration respecting any matter, knowingly makes a false declaration.

“A trivial error in a report should not, in the absence of fraud or bad faith, be made the ground of a charge under (1 a).

“In a charge under sub-sec. (1 b) it will not be necessary to show an intent to defraud the Government or a particular individual, so long as there is shown an intent to defraud somebody. On the other hand, in a charge under sub-sec. (2) an intent to defraud the Government will not support the charge, and it must be shown that there was an intent to defraud or injure some individual, though it is immaterial who that individual is.

“A charge under sub-sec. (2) or (3) should show why it was the accused's duty to preserve the document or to make the declaration; but where the situation of the accused is proved, the court may use their military knowledge to infer his duty.

“Sub-sec. (3) does not include statements in a summary of evidence or verbal statements.”—*M.L.*

#### CHARGE SHEETS.

**Sec. 25 (1):**—The prisoner, No. —, Colour-Sergeant —, etc., is charged with, *In a document signed by him knowingly making a fraudulent statement*, in that he, at —, on [or about] —, [between — and —], in his capacity as pay-sergeant of — company, — Battalion, — Regiment, fraudulently entered in his cash account for the month of —, 18 —, the following item:—Washing bills, three pounds four shillings and two pence, whereas the actual amount paid by him in respect of such bills was two pounds fifteen shillings and four pence.

**Sec. 25 (2):**—The prisoner, No. —, Colour-Sergeant —, etc., is charged with, *Knowingly, and with intent to defraud some person, altering a document which it was his duty to preserve*, in that he, at —, on [or about] —, [between — and —], in the Military Savings Bank, Form No. 2, statement of deposits and withdrawals for the month of —, 18—, altered, with intent to defraud Private —, — Battalion, — Regiment, the figure £2 sterling, representing a withdrawal made by the said private, and changed it into £3 sterling.

**Sec. 25 (2):**—The prisoner, No. —, Orderly-Room Sergeant —, — Battalion, — Regiment, a soldier of the regular forces, is charged with, *Knowingly, and with intent to defraud, making away with a document which it was his duty to preserve*, in that he, at —, on [or about] —, with intent to defraud, burned his Regimental Defaulters' Sheet.

## Section 26.

**Neglecting to Report and Signing in Blank.**—This sec. consists of two sub-secs. as follows:—

The first relates to documents which are vouchers for the subjects or articles mentioned,—

- (1.) When signing any document relating to pay, arms, ammunition, equipments, clothing, regimental necessities, provisions, furniture, bedding, blankets, sheets, utensils, forage, or stores, leaves in blank any material part for which his signature is a voucher; or
- (2.) Refuses, or by culpable neglect omits, to make or send a report or return which it is his duty to make or send.

A document means any paper written or printed. A responsible person signing a blank sheet of paper—which is not a document—intended to be subsequently filled up as a report, return, or any form of document other than those specified, does not commit an offence under this sec. But such a proceeding is an irregularity to be avoided; it is not in accordance with the custom and usage of the service, and an unprincipled person may be tempted to take an illegal advantage of it.

Signing and leaving in blank, as above, where the signature is a *voucher*, any document named is an offence.

All vouchers used in the service are on War Office forms, constituting documents. See **Vouchers**, p. 148.

*Sub-sec. (2).*—The charge must show that it was the duty of the accused to make the report or return. If the report or return was one for which the superior had no right to call, there is no punishment for a refusal to make it. The neglect must be something more than mere forgetfulness or mistake.

Here the essence of the charge would be *Culpable Neglect*, i.e., “such as might reasonably be expected to involve some wrong or injury.”

**Custody of Documents.**—An officer or soldier having access to records, who publishes official documents, or avails himself of them for carrying on personal controversies, or for any private purpose without due authority, commits a breach of official trust.

Officers and soldiers by the Q.R. are prohibited from—

(1.) *Publishing or placing beyond their control*, so that it may find its way into unauthorised hands, information relative to the number, movements, or operations of troops or any military details.

(2.) *Giving publicity* to their individual opinions in any manner tending to prejudice questions that may at the time be undergoing official investigation by the military authorities.

(3.) *Anonymous complaints* and the publication through the Press of anything calculated to act injuriously on the interests of the service or to excite discontent in the army.

Under the head of Acts Calculated to Defraud, in the last issue of the Manual of Military Law, a correction has been made relative to the offence of forgery, which is now clearly defined in chapter VII., page 163.

The *act of forgery* consists of knowingly making a false document, with the intention that it shall be used or acted upon as genuine, *or*, that the actions of some person shall be influenced by the belief that it is genuine.

A document is considered to be a *false document* if a material part of it is altered, or if wrongly dated, with fraudulent intention, etc.; by being thus tampered with, a genuine document may be made a false document.

The *act of forgery* does not amount to the *offence* of forgery, unless the false document is so made with an intent to *defraud*.

"It is quite sufficient if an intention to defraud some person can be inferred from all the circumstances of the case, but a mere general intention to *deceive* the public or particular persons, as, for instance, by forging a surgeon's diploma, or by forging the signature of an officer to a pass, is not an intent to *defraud* within the meaning of this paragraph."—*M.L.*

A soldier using a pass which he knows is not genuine should be tried under sec. 40. The intention in this case would be not to *defraud* but to *deceive*.

#### CHARGE SHEET.

**Sec. 40:** The prisoner, No. —, Private —, etc., is charged with, *An act to the prejudice of good order and military discipline*, in that he, at —, on — made use of [was in possession of] a document purporting to be a genuine pass [to be signed by —], well knowing that it was not genuine [so signed].

### Section 27

**Relates to False Accusations or Statements.** It is divided into four sub-secs. :—

(1.) An officer or soldier making a *false accusation* against another officer or soldier.

A mere false statement not involving an accusation is not within this sub-sec.—"The accused must mean some assertion made publicly or to another person, which, if true, would expose the person respecting whom it is made to punishment or to moral censure. It may be either verbal or in writing. The accused must be proved to have known that it was false."—*O'Dowd*.

(2.) In making a complaint, when he thought himself wronged, *knowingly* making a *false statement* affecting the character of an officer or soldier, or *wilfully* suppressing any material facts.



"A statement made by a prisoner in his defence, *bonâ fide* for the purpose of procuring his acquittal or a lenient punishment, is not an offence, even though false."

(3.) Making a false statement to his C.O. (*not superior officer*), as to *desertion* or *fraudulent enlistment*.

A written statement made for the purpose of being laid before the C.O. is a statement to the C.O.

(4.) Making a false statement to any military officer or justice with respect to the *prolongation of furlough*.

A justice, in some cases, has power to extend a furlough for one month, sec. 173.

*Defamation, Slander, and Calumny* are positive assertions; in the first a serious charge is made *openly*, while in the others circumstances are communicated *secretly*, in the absence of the person to whom they refer, with the intention to injure. Aspersions and insinuations, although indirect representations, may by a side-wind blast a reputation or plant a prejudice in the proper quarter.

"It is to be noted that it is not an offence under this sec. for a soldier to make a complaint, even though it is false, frivolous, and vexatious, provided that he does not make a false statement affecting the character of an officer or soldier, or does not knowingly and wilfully suppress a material fact.

"A soldier stating a falsehood to his superior does not commit an offence under this sec.; but there are circumstances which might make such an act triable under sec. 40."—*O'Dowd*.

#### CHARGE SHEET.

**Sec. 27 (1):**—The prisoner, No. —, etc., is charged with, *Making a false accusation against a soldier, knowing it to be false*, in that he, at —, on —, when appearing before Captain —, — Battalion, — Regiment, to answer for a minor offence, used language to the effect following, that is to say: "The colour-sergeant is not fair in taking men for duty, and no one in the company can get on if he does not give him a bribe," meaning thereby the colour-sergeant of his company, — Battalion, — Regiment, and knowing the said statement to be false.

According to the rules of evidence the burden of proof rests with the party who makes the assertion, or, as stated, "he who asserts the affirmative of a fact must prove it."

#### Sections 28 & 29

**Relate to Offences in Connection with Courts-martial and False Evidence.**—The evidence of a witness without corroboration is not sufficient to prove the falsehood of the matter sworn.

Contempt of court is punishable by summary award under the hand of the president by imprisonment up to 21 days; should this exceptional course be necessary, the court adjourns until the expiration of the imprisonment awarded.



**Section 30.****Offences in Relation to Billeting.****Section 31.****Offences in Relation to Impressment of Carriages.****Sections 32, 33 & 34.****Offences in Relation to Enlistment.****Sections 35 to 39.****Miscellaneous Military Offences.**

**Sec. 37** relates to **Ill-treating a Soldier, or Withholding his Pay.**

- (1.) Strikes or otherwise ill-treats any soldier; or
- (2.) Having received the pay of any officer or soldier, unlawfully detains or unlawfully refuses to pay the same when due, shall on conviction by court-martial be liable.

“*Sub-sec.* (1). Forcing or striking a soldier when acting as sentinel is punishable under sec. 6 (1*d*) more severely than the mere striking a soldier.

“As the word ‘soldier’ includes N.C.O., it follows that the offence of one N.C.O. striking or ill-treating another falls within this sec.”—*M.L.*

**Sec. 38** relates to **Fighting a Duel, or Attempting to Commit Suicide.**—A duel is a fight with deadly weapons. *Conniving* at fighting a duel is an offence under this sec. It means acquiescing in or being aware of the fact without disclosing it to the proper authority.

**Section 40.**

**An Act, Conduct, Disorder, or Neglect to the Prejudice of Good Order and Military Discipline.**—*Provided* that no person shall be charged under this sec. in respect of any offence for which special provision is made in any other part of this Act and which is not a civil offence.

This sec. includes only offences of a military character, and such as are not otherwise provided for in the Act; however, in the event of a person being convicted of a charge under this sec. which ought to have him laid under some other sec., the conviction will hold good, unless it appears that injustice has been done.

In framing charges under sec. 40 care should be taken that the conduct, etc., is specified in the particulars. There is no such

charge as "gross neglect of duty." From the evidence produced, and the military knowledge of the court, it alone will decide whether the act, conduct, etc., was to the *prejudice of good order and military discipline*. The neglect must be wilful or culpable, and to obtain a conviction under any charges under this sec. a guilty intent must be proved beyond all reasonable doubt.

O'Dowd gives a statement of particulars of a charge which would hold good under this sec., the words "in having" or "in that he," at —— being prefixed, "Between the —— and the —— of —— when liable to military duty, indulged in excessive drinking of alcoholic stimulants, thereby inducing *delirium tremens*, and rendering himself incapable of performing such duty."

"In this case it would be necessary to prove the excessive drinking, the subsequent incapacity for duty, and the fact that such incapacity was occasioned by the drinking. The mere fact of a soldier suffering from *delirium tremens* is not an offence."—He further states if a soldier was impertinent to a civilian, or borrowed money from one, or if one soldier borrowed money from a man of the same rank, a charge under this sec. would be bad in law; "but a N.C.O. borrowing money from private soldiers over whom he was placed, might (as I think) be held to have committed an offence under this sec."

### Section 41.

**Offences Punishable by Ordinary Law.**—This sec. gives jurisdiction to a court-martial to try any civil offence with five exceptions, namely, treason, murder, manslaughter, treason-felony, and rape. But even these offences a court-martial may try if committed out of the Queen's dominions, either when on active service, or in a place more than one hundred miles from any city or town in which the offender can be tried for such offence by a competent civil court.

"Where a civil offence is specified in the Act (*e.g.*, secs. 17, 18), an attempt to commit that offence can under (5) be ordinarily tried by court-martial, because by English law an attempt to commit a civil offence is ordinarily in itself an offence."—*M.L.*

"An offence committed by an officer or soldier against the person or property of a civilian, is primarily triable by the ordinary criminal courts. Military law is subordinate to the general law; and if the aggrieved civilian elects to proceed against the soldier before justices, or by indictment, he is entitled to take that course. In many instances, however, it would be more to his interest to have the case disposed of by court-martial, for in that event he would avoid the cost of a prosecution, and in the case of loss of property, or wilful injury, would have a better prospect of being recouped—by means of a sentence of stoppages—than would be afforded by the operation

of the ordinary law. But where the offence is dealt with by court-martial, the aggrieved person has no status beyond that of a witness. He cannot interfere with the conduct of the prosecution, and of course cannot interfere with the power of the C.O. to exercise the discretion, legally vested in him, of dismissing the case if he thinks it ought not to be proceeded with, of punishing the offender summarily, or of sending him for trial by court-martial. At the same time the C.O. would naturally co-operate with the civilian to any legitimate extent which the interests of justice might seem to require."—*O'Dowd*.

## Sections 42 & 43.

### Redress of Wrongs.

**Sec. 42** states the mode of complaint by an officer who thinks himself wronged by his C.O. In due time, after application being made to his C.O., if he does not receive the redress to which he may consider himself entitled, he may complain to the C-in-C., and through him to the Sovereign, in order to obtain justice. See **Local Adjustment of Questions by G.O.C.**, p. 150.

**Sec. 43** states the mode of complaint by a soldier, which is set forth in a form in his pocket ledger. A soldier should first complain to his captain, and then, should the captain refuse to grant him redress of the matter in which he thinks himself wronged, he may complain to his C.O. Here the expression *C.O. means the officer having power to dispose of an offence if committed by the soldier making the complaint*. An officer commanding a detachment is invested with such power; but in certain cases he is liable to restrictions in the exercise of this power. In case a soldier is deprived of his ordinary pay by the award of his C.O., he has a *right* of appeal to a court-martial. A C.O., if he thinks fit, *may* refer any matter concerning a soldier to the general, but a soldier has not the same right of appeal to superior authority as an officer has.

"The only exception to the above rule as to the course of complaints is on occasion of the question which general officers at their yearly inspections are required to put to regiments, as to whether there are any complaints. See p. 99.

"A soldier cannot in any way be punished for making a complaint under this sec., whether it be frivolous or not, and he ought not, for making a complaint, to be treated in any way with harshness or suspicion.

"A false accusation or statement made on preferring a complaint under this sec. is punishable under sec. 27 (1), (2)."

—**M.L.**

Every soldier has a right to complain whenever he thinks himself wronged, and it is the duty of his C.O. to see that justice is done. Through want of knowledge, misapprehension, or

some such cause, a complaint may be made apparently without sufficient reason, yet the man feeling himself aggrieved may have made his complaint in good faith, without the intention to vex or annoy any one or give unnecessary trouble; thus *frivolous* and *vexatious*, as applied to complaints, are old formulæ expunged from among offences against military law.

**Cognate Offences.**—It is provided by sec. 56, in order to prevent a failure of justice, that a person charged with certain offences of a similar nature may be convicted of a cognate offence by *special finding*.

This sec. is of such importance that I will here quote it:—

**Sec. 56.** (1.) A prisoner charged before a court-martial with stealing may be found guilty of embezzlement or of fraudulently misapplying money or property.

(2.) A prisoner charged before a court-martial with embezzlement may be found guilty of stealing or fraudulently misapplying money or property.

(3.) A prisoner charged before a court-martial with desertion may be found guilty of attempting to desert or of being absent without leave.

(4.) A prisoner charged before a court-martial with attempting to desert may be found guilty of desertion or of being absent without leave.

(5.) A prisoner charged before a court-martial with any other offence under this Act may, on failure of proof of an offence being committed under circumstances involving a higher degree of punishment, be found guilty of the same offence as being committed under circumstances involving a less degree of punishment.

For example, a man charged with striking his superior officer in the execution of his office may be convicted of striking his superior officer; and a man charged with an offence committed on active service may be found guilty of the same offence committed not on active service; or, again, a man charged with wilfully allowing the escape of a prisoner may be found guilty of negligently allowing his escape. The converse, of course, is not allowed; that is to say, a prisoner charged with an offence cannot be convicted of a greater offence of the same class.

In practice it will usually be expedient to prefer alternative charges, one charging the greater and the other the less offence, rather than to rely on this sec.

But, except in the cases specified in this sec., a court has no power to find a prisoner guilty of any offence except that with which he is charged. A court, however, may [as allowed by R.P. 43 (e)] find a prisoner guilty of a charge with the exception of certain words, or with certain immaterial variations, and this finding will be valid so long as in its reduced or varied form it discloses an offence under the Act.



## CHAPTER II.

## EVIDENCE AND THE RULES BY WHICH IT IS GOVERNED.

**General Remarks.**—In order to ensure fair play, protect absent persons, prevent loss of time in inquiry, and arrive at just conclusions, certain rules of evidence have been laid down for the guidance of those who conduct judicial inquiries. These rules have been adopted after vast experience in matters requiring investigation.

There are different classes of evidence, such as that derived from matters of universal acceptance or notoriety, admissions, confessions, documents, etc., but the bulk of evidence in legal proceedings is from the statements on oath of a “competent witness speaking directly and from personal knowledge.”

The rules of evidence embrace the subject of the competency of witnesses—often a medical question is involved in this—and those privileges by which witnesses cannot under certain circumstances be compelled to give evidence, also when they are entitled to claim protection; as well as serving as a guide, when required to record a statement of evidence, for the convening officer in cases where a court-martial is applied for, or the taking of evidence on a board, committee, or court of inquiry, these rules are of great importance to the medical witness in all medico-legal cases. Although primarily adopted to further the ends of justice, “to regulate the mode in which questions of fact may be determined for judicial purposes,” nevertheless, in all matters of research, and wherever inquiry is necessary in order to elicit the truth, the rules which govern evidence should be adhered to; their universal adoption in principle, but subject to modification in detail, according to the nature of the investigation, are none the less necessary for the guidance of those who investigate subjects relative to health and disease, than they are when employed to establish the guilt or innocence of an individual.

Proceedings of inquiry, when they are conducted under the following rules, are facilitated, and the conclusions drawn from such systematic proceedings are more likely to be correct than they would be if otherwise conducted, and this under all circumstances will apply to conclusions, whether expressed as suggestions, recommendations, opinions, or decisions.

In all investigations due regard must be attached to the degree of importance of the evidence produced, whether it happens to be primary, secondary, circumstantial, or merely negative; in accordance with such a classification and by reason of its nature,



evidence is weighed and its value estimated in connection with the point in issue or the particular event to which it relates. Hearsay and opinion, as a rule, are not admissible as evidence.

Evidence given in courts-martial is governed by the same rules as are applied in ordinary criminal courts of justice, and the proceedings in these courts are also conducted on the same principles.

In all text books of military law reference is made to the rules of evidence and their application, but in none do I find the subject so thoroughly dealt with as in the *Official Manual of Military Law*, which being compiled by professional men, and issued by authority, is the source from which military writers of necessity draw their information.

The following is from chapter VI., *Manual of Military Law*, to which the reader is referred for further information on this subject:—

**Meaning of Rules of Evidence.**—"The rules of evidence are the rules which regulate the mode in which questions of fact may be determined for judicial purposes. The object of every criminal trial is, or may be, to determine two classes of questions—questions of fact and questions of law. If the accused persons pleads guilty there is no question of fact involved in the trial. But if he does not, he raises two questions or issues, first, whether the facts charged against him happened, and, next, if they did happen, what is their legal consequence.

"In trial by jury these two questions are answered by different persons. The jury, *under the guidance of the judge*, find the facts. The judge lays down the law. It was with reference to trial by jury that the English rules of evidence were originally framed, and it is to this mode of trial that they are still primarily applicable. They are, in fact, the rules in accordance with which a judge guides a jury. In trials before courts-martial, the members of the court both find the facts and lay down the law, and thus perform the functions of both jury and judge."

**The Nature and Classification of Evidence.**—The means of proof or evidence usually consist of statements made by witnesses under examination in courts of law. These statements are on oath, and must be made by a competent witness "speaking directly and from personal knowledge," or evidence may be given by documents legally admissible produced for inspection. Therefore evidence is commonly classified as being either oral or documentary. See p. 41.

**The Difference between Judicial and Non-judicial Inquiries, Direct and Indirect Evidence.**—"There is no difference in principle between the method of inquiry in judicial and in extra-judicial proceedings. In either case a person who wishes to find out whether a particular event did or did not happen, tries in the first place to obtain information from persons who were present and saw what happened (*direct evidence*),

and, failing that, to obtain information from persons who can tell him about facts from which he can draw an inference as to whether the event did or did not happen (*indirect* evidence). But in judicial inquiries the information given must be on oath, and be liable to be tested by cross-examination, and there are certain rules of law which exclude from the consideration of a jury particular classes of indirect evidence which an ordinary inquirer would naturally take into consideration. Statements so excluded are said to be 'not admissible as evidence,' or 'not evidence.' And if a member of a court-martial is in doubt whether a statement which it is proposed to make to him is, or is not, admissible as evidence, the most useful advice that can be given to him is, first to use his common sense as to whether the matter proposed to be proved has any practical bearing on the question which it has to try, and, if he thinks that it has, then to consider whether it falls within any one of the negative or exclusive rules of law."—*M.L.*

**The Principal Matters with which the Rules of Evidence are concerned are Classified as follows:—**

- (i.) *What must be proved.*
- (ii.) *What facts are assumed to be known* (judicial notice).
- (iii.) *By which side proof must be given* (burden of proof).
- (iv.) *What statements are admissible as evidence* (admissibility of evidence).
- (v.) *When admissions or confessions may be admitted as evidence.*
- (vi.) *Who may give evidence* (competency of witnesses).
- (vii.) *What questions need not be answered, and what documents need not be produced* (privilege of witnesses).
- (viii.) *How evidence is to be given.*

**Rule I. What must be Proved?**—In order to obtain a conviction, the particular charge brought. As a rule every charge alleges a specific offence. *The substance or essence of the charge is enough to prove.* In cases where the distinction is one of degree but not of kind, a prisoner charged with the greater may be convicted of the lesser offence. Thus a person charged with stealing may be convicted of embezzlement—or with murder, of manslaughter.

**Rule II. What Facts are Assumed to be Known?**—The court is said to take *judicial notice*, in other words, not to require evidence, of any fact which is of such notoriety as not to require proof.

**Rule III. By which side must Proof be given?**—On whom does the **Burden of Proof** fall?—In considering the practice as to the burden of proof, regard must be had to two rules: *first*, that every man is presumed to be innocent until he is proved to be guilty; and, *second*, that he who asserts the affirmative of a fact must prove it. It follows, from both these rules, that it is incumbent on the prosecution in the first instance to give evidence of the commission of the crime, or of facts from

which the court may reasonably infer that it has been committed, and that then, but not till then, the prisoner is bound to prove any facts from which he wishes the court to infer his innocence.

In a charge of leaving the ranks or a post without orders, absence without leave, releasing a prisoner without authority, or detaining a prisoner unnecessarily, it would lie on the person charged to prove that the requisite orders, leave, or authority had been given, or that the necessity existed. On the other hand, when a prisoner is charged with breaking out of barracks, it would lie on the prosecutor in the first instance to prove that the prisoner was confined thereto.

As the trial goes on the *burden of proof* may be shifted from the prosecutor to the prisoner by the proof of facts which raise a presumption of his guilt.

“When it is proved that an unlawful act has been committed, a criminal intention is *presumed*, and the proof of justification or excuse lies on the prisoner.”

**Rule IV. What Statements are Admissible as Evidence?**—This embraces two sub-rules—the rule of relevancy and rule of best evidence.

**Rule of Relevancy.**—Nothing shall be admitted as evidence which does not *tend immediately* to prove or disprove the charge. No precise line can be drawn, or hard and fast rule applied, to distinguish between relevant and irrelevant facts. Evidence must be determined by the spirit of the rule and not according to the strictness of its letter, and the same may be said of all regulations and orders issued for general guidance, whose spirit is more binding than the phraseology in which their meaning is conveyed. In all such cases common sense must decide.

“Evidence must be relevant to the issue, that is, to the question whether the prisoner is guilty or not guilty.

“Relevant evidence includes statements of any fact or condition of things directly or indirectly connected with, qualifying, supplying a motive for, showing a preparation for, affording an explanation of, showing a cause or effect of, disclosing the impossibility or improbability of, or affecting the credibility of a witness to, the facts forming the essential allegations of the charge.”—*O’Dowd*.

*Res gestæ*, matters intimately bearing on or connected with facts charged, although not directly the point in issue are so connected with it as to form one transaction, are admissible. On a trial such evidence may be required to explain the character of the offence.

The conduct of an accused person observed after a crime has been committed, and the manner in which he treated statements made in his hearing with respect to the crime with which he is charged, are admissible.

**Rule of Best Evidence.**—The evidence produced must be the best obtainable under the circumstances, and the most

direct as to the facts of the case must be the first given. Indirect or secondary evidence is only admissible after proof that direct or primary evidence cannot be obtained. In recording the statements of witnesses brought before a court-martial, board, court of inquiry, or committee, as well as on similar occasions, evidence should be taken according to the degree of its importance in connection with the subject to which it relates; thus the first witness called should be the best evidence available.

The necessity for producing the best evidence is thus stated in the Official Manual M.L.:—

“No evidence which leads us to suppose that other and better evidence remains behind can be admitted, as the production of such inferior evidence suggests that there is some secret or sinister motive for withholding the better and more satisfactory evidence.

“The rule in question is chiefly applicable to documentary evidence, and is usually applied in the form of the two well-known sub-rules: (1) That a verbal account of the contents of a document can never be received if the document itself is obtainable; (2) that, subject to certain exceptions, a copy of a document is not admissible when the original document can be produced. In these cases the document itself is said to be primary, whilst the verbal account, or the copy, is called secondary evidence.”

**Secondary Evidence** may be given in many cases as to the contents of official documents (A.A., secs. 72 and 163), but for private documents it is more restricted. The law protects bankers in a great measure from having their accounts exposed in court.

**Certificate, Report.**—Certificate—definition, a statement usually, though not necessarily, in writing, given by a person having some official status relative to some matter within his official knowledge or authority. A report is a statement, either oral or written, of matters not necessarily within the personal knowledge of the individual who makes it. A report may be made without any expression of opinion relative to the matter reported on; briefly, a certificate *is* evidence, a report *is not*.

**Certified Copy.**—A certified copy is *one signed and certified as true by the official in whose custody the original document is*. It is on this principle that the C.O., who holds a soldier's regimental defaulter sheet, is the only person who can certify as to the character of the man.

**Medical Certificate.**—A medical certificate is a statement of personally ascertained facts, together with an opinion regarding them which is the outcome of medical knowledge and belief. This certificate is accepted as made, according to the law of Scotland, “on soul and conscience.” It contains a declaration of belief in connection with facts, events,



and symptoms—objective and subjective—within a duly qualified medical officer's professional knowledge. As a document in the service, it is written on a prescribed form, and usually runs thus: 1. I do hereby certify that I examined A.B.—2. And find, etc.—3. And that in consequence thereof I consider him to be incapable of, etc.—4. I further declare my belief that he will not be able to resume his duty, etc. This will have to be altered according to circumstances; a certificate may be required as to a good state of health. Before commencing any certificate it is well to state the name of the officer and grounds of his application; this will show for what purpose the certificate was given.

It is against the nature of a certificate that one from a civil practitioner, without any military status, as to the health of an officer or soldier could be accepted by the military authorities or receive official recognition. See **Approving Officer**, p. 180.

**Direct, Indirect, and Circumstantial Evidence.**—In connection with the rule as to best evidence, reference may be made to the distinction between direct and indirect evidence. By direct evidence is meant the statement of a person who saw, or otherwise observed with his senses, the fact in question. By indirect, or, as it is often called, circumstantial evidence, is meant evidence of facts from which the fact in question may be inferred or presumed. Direct evidence is not better than indirect or circumstantial evidence, the difference between them being one not of *degree* but of *kind*.

**Circumstantial Evidence**, sometimes called *Presumptive Evidence*, “is in no way inferior to direct evidence, and is in some respects superior to it; for it has become a proverb that “facts cannot lie,” whilst witnesses may. On the other hand, it must always be borne in mind that if facts cannot “lie,” they may, and often do, deceive; in other words, that the interpretation which they appear to suggest is not that which ought to be placed upon them. Therefore, before the court finds a prisoner guilty on circumstantial evidence, it must be satisfied, to use the expression of a late learned judge, not only that the circumstances are consistent with the prisoner having committed the act, but that they are inconsistent with any other rational conclusion than that the prisoner was the guilty person.”—*M.L.*

An illustration of the difference between good and bad circumstantial evidence may be found at page 83 of the Manual *M.L.*

**Evidence of a Disposition to Commit Certain Crimes.**—Evidence of facts tending to show a general disposition to commit similar offences is not admissible; for instance, on a trial for murder, evidence could not be given to show by his action towards others that the accused was of a “bloodthirsty and murderous disposition.” So on a charge against a sentry for having been asleep on his post, evidence that he had been found asleep on his post on other occasions would not be admissible for the purpose

of showing that he would be likely to commit the offence: the same applies to cases of insubordinate conduct, etc. Medical testimony may be given to show that a man was physically incapable, through illness, excessive fatigue, or exhaustion, of keeping awake or of executing an order.

Where several offences form part of an entire transaction, evidence of one is admissible as proof of the other.

"Where intention, knowledge, good or bad faith, malice, or any other state of mind, is a necessary ingredient of the offence charged, evidence may, for the purpose of proving the existence of such a state of mind, be given of similar acts committed by the accused on different occasions."

In case of a charge for insubordinate language or writings, after the fact is proved, evidence may be given to show the intention of the accused. Evidence as to the motive, preparation, subsequent conduct, and statements made in the presence or hearing of the accused are admissible. See p. 83.

**Evidence as to Character, Reputation, or Antecedents,** although admissible for the defence, is not as a rule admissible for the prosecution.

"This rule is most important, to prevent the injustice which might arise from prejudice or unpopularity. 'Give a dog a bad name and hang him,' represents the popular instinct: 'A man shall not be convicted because he has a bad name,' says the law. For this reason the prosecutor may not give evidence of character, except to rebut evidence to a contrary effect given on behalf of the prisoner.

"On the other hand, the prisoner may call witnesses to speak generally as to his character. He may put in evidence particular instances where his conduct has been publicly approved by superior officers; or, if a soldier, may call for the defaulters' book to prove that there are no entries against him, or none of a serious character."—*M.L.*

**The Effect of Evidence as to Character.**—"Evidence of general good character cannot avail the prisoner against evidence of the fact, but where some reasonable doubt exists as to his guilt, it may tend to strengthen a presumption of innocence; and where intention is a principal ingredient in the offence, or where presumptive proof only is adduced, evidence as to character bearing on the charge may be highly important and serve to explain the prisoner's conduct . . . But it would be manifestly absurd and irrelevant on a charge of stealing to allow character for bravery to weigh in the scales of proof; or on a charge of cowardice to be biassed by a character of honesty."—*M.L.*

A man may be brave enough to "carry on" in the service and yet be capable of stealing manuscript, as occurred in the case of this book, an offence which put the author to much inconvenience and caused a delay in publishing.

Cases of *à priori* evidence are seldom of much value. A case occurred recently in a police court, in which a man accused of assaulting his wife pleaded that it was impossible for him to have done so as he said his prayers every night.

**Hearsay.**—This term is primarily applicable to what a witness has heard another person say with respect to facts or disputes, but it extends to all statements. The reason for excluding such statements are because of their not being made on oath, and the person to be affected by the statement has no opportunity of cross-examining its author.

The rule as to hearsay, in its narrower sense, may be stated as follows:—"No verbal statements with reference to a person charged with an offence, relative to the charge, made in his absence, can be received in evidence against him."

Hearsay as evidence is not admissible unless it forms part of the *res gestæ*. Thus a medical witness, although he may state the words he heard used in direct reference to the case which is the subject of inquiry, he could not refer to another case in support of his views.

**Opinion.**—"The general rule is that the opinion or belief of a witness is not evidence. A witness must depose to the particular facts which he has seen, heard, or otherwise observed, and it is for the court to draw the necessary inferences from those facts. Thus a witness may not, on a trial for desertion, characterise the prisoner's absence as 'desertion.' This is a matter of inference, and is the point which it rests with the court to determine according to the evidence. The examination of the witness should be confined to the fact of the prisoner's absentsing himself, and to such other facts relevant to the charge as may be within the *knowledge* of the witness."

Opinion derived from a witness' impressions of circumstances as to the conduct, deportment, or language of an accused person may be given in evidence.

**Experts.**—"The chief exception to this rule relates to the evidence of experts. The opinion of an expert, that is to say, a person specially skilled in any science or art, is admissible as evidence on any point within the range of his special knowledge.

**Medical Experts.**—"In a poisoning case, a doctor may be asked as an expert whether in his opinion a particular poison produces particular symptoms. And where lunacy is set up as a defence, an expert may be asked whether in his opinion the symptoms exhibited by the alleged lunatic commonly show unsoundness of mind, and whether such unsoundness of mind usually renders persons incapable of knowing the nature of their acts, or of knowing that what they do is either wrong or contrary to law. But in neither of those cases could the expert be asked whether the particular symptoms in fact existed in the particular case."—*M.L.*

It is a principle in the law that "where scientific men are called as witnesses, they are not entitled to give their opinion as to the *merits of the case*, but as to the *facts proved on the trial*." Warning medical witnesses against the risk of partiality and prejudice, Percival says, the witness should "use his best endeavours that his mind be clear and collected, unawed by fear, and uninfluenced by favour or enmity." A M.O.'s conscience is most likely to be trespassed upon and his judgment biassed under the impression of furthering the ends of discipline, yet this to him, as a witness, should be quite outside his province, no matter by which side he is called. It is laid down by the R.P. that even the prosecutor on a court-martial is to be a perfectly impartial person.

Although great responsibility frequently falls upon a medical witness, he should remember that he is not responsible for the consequences to which honestly expressed opinions may lead, provided they are always the result of careful investigation, cautious inquiry, and due reflection. The responsibility in reality is no greater than that of a doctor towards his patient.

When the reasoning faculties have matured the thoughts, the opinion formed is but the result of evidence regarded with judgment, assisted by knowledge and experience. If the judgment is warped by prejudice, the opinions or decisions probably will be erroneous, nevertheless they must be honest. Logically there is no such thing as a dishonest opinion or belief, but either may be dishonestly expressed. The rule which states opinion is not evidence, does not exclude evidence as to belief; if a witness has a doubt in his mind, it is admissible for him to swear to the "best of his belief," or he may state what he "thinks" or "believes," and is liable to be convicted of perjury if he thus swears falsely.

A M.O. should be careful not to express a very positive opinion or deliver judgment on subjects to which he has not recently applied his mind. In these days of advancement and discovery it is by no means easy to keep abreast of the times, and it should be no reflection on him if he be unable to give an immediate and unqualified opinion on many matters embraced within his profession. He should also guard against asserting as facts things which are merely matters of opinion, and it is well to bear in mind that when giving evidence as an ordinary witness his professional opinion is not required. Although a witness may not quote the opinions of others to establish his own views of a case, he may be asked whether he concurs with opinions expressed in medical works.

From the uncertain and undefined basis upon which medical opinion is founded, a divergence must naturally be looked for among witnesses, and counsel not unfrequently make capital out of this. Medical science deals with the phenomena of life and nature as presented to us; for the exploration and inter-



pretation of the cause of these the exact sciences, such as chemistry, together with mechanical means of research, are called to our aid. It is because medicine as a science is bound up with *life*—an undefined thing, known only as a principle evolving vital activity—that opinion in matters relating to it are so frequently at variance with one another. Owing to a somewhat similar cause, opinions among theologians differ on fundamental principles and rules of procedure; but the same cannot be said of judges and lawyers, who so frequently differ among themselves, although they make their own laws, rules, and regulations. When a M.O. is unable to identify or demonstrate the cause which warped, deranged, or otherwise howsoever impaired vitality, or cannot clearly define the mode of action of each cause, it is unfair to pronounce his opinions mere guess-work. As an example of the difficulties to contend against in some instances, it may be convenient to cite the case of the Claimant: he was no microscopic object, yet it required a great deal of time, money, and forensic talent to identify him.

**Dying Declarations.**—They are admissible only in trials for murder or manslaughter. “In such trials a declaration made by the person killed as to the cause of his death, or as to any of the circumstances of the transaction which resulted in his death, is admissible as evidence if it is proved that the declarant at the time of making the declaration was in actual danger of death, and had given up all hopes of recovery.

“‘Dying declarations,’ said Mr. Justice Byles in a recent case, ‘ought to be admitted with scrupulous, I had almost said with superstitious, care. They have not necessarily the sanction of an oath; they are made in the absence of the prisoner; the person making them is not subject to cross-examination, and is in no peril of prosecution for perjury. There is also great danger of omissions and of misrepresentations, both by the declarant and the witness. To make a dying declaration admissible there must be an expectation of impending and almost immediate death from the causes then operating. The authorities show that there must be *no hope* whatever.

“The circumstances under which, in trials for murder, statements by the person alleged to have been murdered as to the cause of his death are and are not admissible as evidence against the prisoner may be illustrated by the following cases:—

- (a.) At the time of making the statement the deceased had no hope of recovery, though his doctor had, and he lived ten days after making the statement. The statement was not admitted as evidence.
- (b.) The deceased, at the time of making the statement (which was written down), said something which was taken down thus: ‘I make the above statement with the fear of death before me, and with no hope of recovery.’ On the statement being read over, she corrected this to

'with no hope *at present* of my recovery.' She died thirteen hours afterwards. The statement was not admitted as evidence.

- (c.) A woman alleged by the prosecutor to have had her throat cut, and so to have been killed by the prisoner, was seen some ten or fifteen minutes before her death, coming from her house, at a distance of from twenty-five to thirty yards from her door, holding her apron to her throat; when, meeting a woman who was coming towards her, she exclaimed, 'Oh dear, aunt! see what Bedingfield' (the prisoner) 'has done to me.' The judge was not satisfied that the deceased was conscious of the immediate approach of death. The statement was not admitted as evidence."—*M.L.*

Some legal authorities consider such a statement as this, which occurred in the case of a Mrs. Rudd, admissible as part of the *res gestæ*, and this appears to be most reasonable.

**Dying Depositions.**—"It may sometimes happen that a material witness, who has given evidence at the preliminary inquiry, cannot attend at the trial. In proceedings before a civil court for indictable offences, provision is made for such cases by a statute which enacts that the deposition may be read as evidence on proof that the witness is dead, or so ill as not to be able to travel; that the deposition was taken in the presence of the accused person; that the accused then had a full opportunity of cross-examining the deponent; and further, on *prima facie* evidence, that the deposition is signed by the justice by or before whom it purports to be taken. This provision would be applicable where such depositions are required by a court-martial on a trial for an offence under sec. 41 of the A.A."—*M.L.*

**Rule V. Admissions and Confessions.**—Admissions are not evidence in criminal proceedings. Admissions, as distinguished from confession by a prisoner, are, strictly speaking, not admissible as evidence; the practice of courts-martial is to receive admissions made in open court as to collateral and comparatively unimportant facts. Admitting the authenticity of letters, documents, store-lists, or accounts expedite proceedings where they do not go to the merits of the case before the court. A confession, as a rule, is only admissible against the person who makes it. A confession *must be voluntary* to be admissible in evidence; a confession extorted as a matter of religious duty is a voluntary confession. A prisoner making a confession of guilt to a gaoler, under a promise that he would let him see his wife, would be admissible in evidence; a confession otherwise admissible does not become inadmissible merely because it was made under a promise of secrecy, or in consequence of a deception practised for the purpose of obtaining it, or because the prisoner was not warned that anything he might say might be given in evidence against him. To make a confession involuntary, a

*promise to escape from the consequences of the charge must be made to the accused by a person having power to release him.*

If a confession is given in evidence, the whole of it must be given, and not merely the parts disadvantageous to the accused person.

In case of a confession or dying declaration being made to a M.O., he should commit it to paper, read it over to the person making the statement, and get him to sign it and countersign it himself; he should also make a note at the time of the circumstances under which the statement was made, and the physical and mental state of the person making it. A confession may be made in good faith and yet be untrue. Formerly persons who confessed to witchcraft were treated according to the enlightenment of the age. In case of fatal injury, to a death-bed or dying declaration, the surgeon should add his opinion as to whether he considered there was hope of recovery. It is only when such declarations are made after all hope is abandoned by patient and surgeon that they will be accepted as if they were made on oath.

The effect of a witness making a confession while giving evidence on oath, or while a matter is under investigation by his C.O., is thus stated in the Manual M.L. :—

“Evidence amounting to a confession may be used as such against the person who gives it, though it was given on oath, and though the proceeding in which it was given had reference to the same subject-matter as the proceeding in which it is to be used, and though the witness might have refused to answer the questions put to him; but if, after refusing to answer such questions, the witness is improperly compelled to answer, his answers are not a voluntary confession (*a*). Thus A was charged with maliciously wounding B. Before the magistrates A had appeared as a witness for C, who was charged with the same offence. A's deposition was allowed to be used against him on his own trial (*b*). The same rule would appear to apply to statements made by a prisoner before his C.O.; but the proceedings of a court of inquiry cannot be used as evidence against an officer or soldier before a court-martial (*c*).”

**Rule VI. Who may give Evidence.**—This rule applies to the competency of witnesses.

As a rule any person is competent to give evidence as a witness; but if, in the opinion of the court, he is prevented by extreme youth or disease affecting his mind from understanding the questions, etc., he may be excluded. Formerly persons were disqualified by crime, interest, or being parties to the proceedings; now no person is excluded on this account, or on account of moral or religious grounds. Although a competent witness, the character of a person may affect his credibility.

**The Chief Exceptions to Competency of Witnesses.—**

*First.* That, subject to certain qualifications, husband and wife are not competent to give evidence for or against each other.

This does not apply where the trial is for violence inflicted by the husband on the wife, or *vice versâ*, or where the husband or wife prosecutes the other for some offence relating to property. No other relations are in any way disqualified from swearing against each other.

*Secondly.* That persons jointly arraigned and being tried together are not competent to give evidence for or against each other.

If, therefore, it is thought desirable to use against one prisoner the evidence of another who is being tried with him, the latter should be released, or a separate verdict of not guilty taken against him. And if a prisoner thinks that the evidence of one or more of the other prisoners proposed to be conjointly arraigned with him will be material to his defence, he should claim a separate trial.

The evidence of an accomplice is admissible against his principal, and *vice versâ*, unless they are being tried together.

"A member of a court-martial is a competent witness in favour of a prisoner, and might, as such, be sworn to give evidence at any stage of the proceedings; but the A.A. and R.P. direct that a witness for the prosecution shall not sit on a court-martial for the trial of any prisoner against whom he is witness."—*M.L.*

**Rule VII. Privileges of Witnesses.**—It does not follow because a person is competent to give evidence he is therefore compellable to do so. No one is compelled to criminate himself. A witness is not bound to answer a question which, in the opinion of the court, has a tendency to expose either himself or his wife to any *criminal* charge, penalty, or forfeiture which the court regards as reasonably likely to be preferred or sued for (*see Confessions*). The privilege as to criminating answers does not cover answers merely tending to establish a civil liability, such as the withholding of a document, because it may show he owes a debt to the Crown or anybody else.

There is a class of privileges based on considerations of public policy. No one can be compelled to give evidence relating to affairs of State, public affairs, official communications of a confidential character, or those where the Government is immediately concerned.

A legal adviser is not permitted to disclose any communications connected with his employment without his client's consent, but any such communication made to a legal adviser in the furtherance of any criminal purpose, or facts observed in the course of his employment showing that any crime or fraud has



been committed since the commencement of his employment, would debar him from claiming privilege in these matters.

**Rule VIII. How Evidence is to be given.**—This is the last matter with which the rules of evidence are concerned; it relates to the recognised mode of procedure in connection with the foregoing rules. The same rules as are adopted in civil courts will be followed in courts-martial.

Every witness giving evidence before a court-martial is sworn. All questions are put to witnesses direct by the prosecutor, prisoner, or Judge-Advocate-General, but the witness in replying will address the court.

The evidence of every witness is read over to him before he leaves the court, and he may offer or be called upon by the court to explain or to reconcile answers which may appear to be inconsistent.

**Examination-in-Chief.**—A witness is first examined by the party who produces him. This is his direct examination, or *examination-in-chief*. Questions put to witnesses in this examination must be strictly relevant to the points at issue. No *leading questions* must be asked on material points. A leading question is one which suggests the answer required by the questioner; they can nearly always be answered by “Yes” or “No.”

Examples of leading questions—“Were you in the canteen on the afternoon of the 12th inst.?” “Had the prisoner his helmet on?”—instead of asking, “Where were you during the afternoon of the 12th inst.?” “Had the prisoner anything on his head?”

**Exceptions.**—At the discretion of the court a witness unable to answer through defective memory, or the complicated nature of the subject on which he is interrogated, may be asked leading questions. When a witness is unwilling to answer direct questions, the party calling him may, with the permission of the court, treat the witness as a hostile one, and subject him to cross-examination and ask him leading questions. To identify persons or things which have been already described, the attention of the witness may be directly called to them; or when produced to contradict certain facts sworn to, he may be asked in pointed terms whether such facts ever occurred. When a point is not disputed, or is merely introductory, a leading question may be asked in order to save time.

**Refreshing Memory.**—A witness may refresh his memory as follows by reference to notes made by him:—“A witness may not read his evidence or refer to notes of evidence already given by him, but he may, while under examination, refresh his memory by referring to any writing made by himself at the time of the transaction concerning which he is questioned, or so soon afterwards that the court consider it likely that the transaction was at that time fresh in his memory. The witness may also refer to any such writing made by any other person, and

read by the witness within the time aforesaid, if when he read it he knew it to be correct. Any writing so referred to must be produced and shown to the adverse party, if he requires it, and that party may, if he pleases, cross-examine the witness upon it."

When inspecting a dead body or making an autopsy, a M.O. while recording facts should carefully avoid expressing any opinion in such notes.

**Notes referred to by a Witness are not Evidence of themselves.**—"A witness who refreshes his memory by reference to a writing, must always swear positively as to the fact, or that he has a perfect recollection that the fact was truly stated in the memorandum or entry at the time it was written. If, on referring to a memorandum not made by himself, he can neither recollect the fact nor recall his conviction as to the truth of the account or writing when the facts were fresh in his memory, so that he cannot speak as to the fact further than as finding it noted in a written entry, his testimony is objectionable as hearsay."—*M.L.*

**Cross - Examination.**—When the examination-in-chief is finished, the witness may be cross-examined by the adverse party to the proceeding, and on the conclusion of the cross-examination may be **re-examined** by the person calling him on matters raised by the cross-examination. The object of cross-examination is to test the accuracy of the evidence given, and to endeavour to show the matter in a different light. In cross-examination leading and irrelevant questions are allowed. The object aimed at, as a rule, is to refute or explain or discredit the evidence given, or to discredit the person who gave it; thus questions may be put to test the veracity, accuracy, or credibility of a witness, or to shake his credit by injuring his character. The court should protect the witness against imputations which, even if true, would not affect their opinion as to the matter in issue. Re-examination is strictly confined to such matters as have arisen out of cross-examination; no new matter should be introduced.

With the permission of the court, witnesses may be recalled; the court can recall any witness.

"The minutes of a court of inquiry cannot be called for by courts-martial, nor witnesses examined as to their contents, without the consent of the superior military authority by whose order the court of inquiry was assembled."—*M.L.*

Medical witnesses are not privileged to withhold from a court facts within their knowledge, but the secret a M.O. is thus bound to disclose in a court of law on oath might be an indiscretion, or even a grave breach of honour and professional etiquette, if volunteered in the ordinary intercourse of society.

## CHAPTER III.

## MEDICO-LEGAL EVIDENCE.

HAVING referred to the secs. of the A.A. necessary for the maintenance of good order and military discipline among those subject to military law, and the rules of evidence, before passing on to the rules of procedure under which the law is administered and brought into force in order to fulfil its purpose, reference will be made to some offences against the person which can be dealt with either as civil offences under the criminal law or under sec. 41 of the A.A., as such cases at all times and in all courts of law engage the attention of the medical jurist. Special reference is here made to the medico-legal questions connected with this class of crime.

In pursuance of the object of this work the quotations from authorities on the subject of Legal Medicine are selected from well-known and reliable authors. The crimes are here stated according to the Official Manual of Military Law.

The medico-legal references are chiefly from Taylor's "Manual of Medical Jurisprudence," Professor Ogston's writings, and Drs. Guy and Ferrier's "Forensic Medicine." In the introduction to the last mentioned work, it is stated that the subject of which we are now treating is established as a distinct science. It is added, "The State avails itself of the knowledge, experience, and skill of the medical man for three distinct purposes:—1. For the care of soldiers and sailors, prisoners, paupers, lunatics, and others for whose safety it makes itself responsible; 2. As officers of health; and 3. As skilled witnesses in courts of law.

"The duties of the medical man in the first of these capacities do not differ much from those which devolve upon him in the ordinary practice of his profession; but he is expected to give attention to the prevention as well as the cure of disease, and to add to professional skill administrative talent.

"As health officers, however, and as witnesses in courts of law, medical men have duties to perform for which the ordinary practice of their profession affords no adequate preparation—medical education, till of late years, no proper training—and medical literature no sufficient guidance."

Every soldier admitted into hospital on account of an injury received otherwise than on active service, has a board of officers assembled to inquire into the cause of the injury. A M.O. attends these boards as a witness to give evidence regarding the nature of the injury and probable cause, also in order to express an opinion as to the likelihood of its ultimately interfering with the man's efficiency as a soldier. In the event of the man being discharged the service, although not by invaliding, either directly or indirectly connected with the injury, these inquiries will be

taken into account by the Chelsea Commissioners when considering the soldier's claims to compensation by gratuity or pension.

If a soldier's illness is *certified as due to an illegal act of which he is convicted*, he will forfeit his *entire pay without residue* for each day spent in hospital: for instance, if a soldier is injured while resisting an escort and convicted of the offence, should he require hospital treatment for the injury that resulted from his illegal act, he will forfeit his pay while incapacitated thus from fulfilling his military engagement.

The number of injuries requiring boards annually is between eighteen and nineteen thousand. It is not stated how many of them are occasioned by accidents on duty.

**Suicides in the Army.**—In 1885 there were 70 cases of suicide, 30 of which occurred in the United Kingdom—an exceptional year both as regards the unusually high number, which on an average might be taken as 45, and the proportion of suicides which occurred at home, which for the five years preceding were in the proportion of two abroad for one at home. In 1885 there was an exceptional call on the army—it was the year of the Suakin expedition.

Taking the whole army for the period from 1880 to 1884 the ratio of suicides per 10,000 of strength varied as follows:—3·25, 2·87, 3·52, 2·97, 2·61.

From tables of comparison between the ratios of suicides in the whole army and the male population of England taken from the Registrar General's Reports it appears—"In this comparison the rate of suicides in the army between 20 and 24 years of age inclusive is observed to be about  $2\frac{1}{2}$  times as great as that of the civil male population at the same age; in the second period, 25 to 34 years of age, it is about four times as great; in the third period, 35 to 45 years of age, the rate in the army is about three times as great as in the civil population."

As the majority of suicides occurred abroad, the comparison between men on home service and the civil population is proportionately reduced.

The following table has been prepared to show the per-centage of different modes of suicide among soldiers and among civilians, the former calculated from returns for 1884, and the latter from returns in the Registrar General's Report for 1883:—

Modes.	Per-centage. Army.	Per-centage. Civilians.
Gunshot - - - - -	69·6	7·8
Cut-throat - - - - -	10·9	19·3
Hanging - - - - -	2·1	38·8
Drowning - - - - -	2·1	19·7
Poison - - - - -	6·6	12·3
Fracture (jumping from a height, etc.) -	8·7	2·1
Total - - - - -	100·0	100·0



“The very great prevalence in the army of suicide by gunshot is at once observed, amounting to 69·6 per cent., as compared with 7·8 per cent. among civilians. This, of course, is due to the possession of arms and ammunition by the soldiers. From this table it would appear that suicides by cut-throat or poison are about twice as prevalent among civilians as among military, drowning about nine times, and hanging about 19 times as prevalent. Fracture of the skull by jumping from a height is in this return four times more frequent among soldiers than among civilians.

“The following points regarding suicide in the army in 1884 may also be noticed:—

“In one battalion three suicides occurred during the year, and in four battalions there were two suicides respectively. In one battery also there were two cases. The remaining cases were all single instances in different corps.

“The average age at which suicides took place was  $28\frac{1}{2}$  years, and the average service  $8\frac{3}{4}$  years, which shows that change from civil to military life, with its restrictions and discipline, is not, as has been sometimes stated, a frequent cause of suicide.”—*Army Medical Report for the year 1884.*

An attempt to commit suicide is an offence triable under sec. 38, A.A., punishable with two years' imprisonment.

The above shows that a considerable amount of most important evidence is required from the Medical Staff; moreover, the professional evidence that they are called upon to give may have no connection with the military service.

In all cases of sudden death of a soldier not on active service, or not manifestly due to natural causes, a report stating the circumstance should be made to the coroner; in India, to the cantonment magistrate or assistant-commissioner. Pending a decision, no “post-mortem” examination should take place under military authority, as the body which forms the subject of an inquest is within the legal possession of the coroner until a verdict is returned. A M.O. should carefully avoid any post-mortem interference in the matter until the examination is duly authorised. A M.O. who performs a post-mortem examination on the body of a soldier, does not do so in his military capacity provided the examination is done by order of the coroner, in which case the M.O. is entitled to his fee. In connection with this subject it is worthy of note that a military hospital is not a “public institution,” notwithstanding a military prison is one. Whenever a death occurs in a civil hospital, which is a public institution, no fee can be demanded on account of a post-mortem examination.

“It appears that the question of calling medical witnesses to give evidence at inquests is discretionary on the part of the coroner, but should the coroner fail to summon a medical man

to give evidence at the inquest, it is in the power of the jury to request the coroner to do so, and they can name the medical witness they desire to be summoned."—*British Medical Journal*, 1st June 1889.

As the medical inspection of a body may furnish valuable information in connection with other evidence in the case, care should be taken that general witnesses are excluded from knowing what is observed in the inspection or dissection of the body, or becoming acquainted with medical opinions respecting them. Only those M.Os. named in a warrant should be present at the post-mortem examination.

To constitute the crime of theft it is necessary to deprive the owner of his property in the thing stolen: it is considered human dead bodies are things not capable of being stolen. Possibly on the same principle landed property or water running freely over it cannot be stolen: there is no absolute property right in land, it being all held conditionally from the Crown. By removing landmarks the taking and carrying away necessary to constitute theft does not occur.

Extra duties beyond their military duties are not unfrequently exacted from officers of the Medical Staff. With respect to their remuneration for such duties a good deal of misconception exists. The following incident, which occurred in one of our colonies, may be taken as an example:—A soldier had his arm broken by a civilian in a row. I attended the police court, and subsequently the higher court of justice, as a witness for the prosecution. The Governor of the colony refused to pay me for my services, on the grounds that my entire services were engaged by the Crown, and it was a Crown prosecution on which I was employed; the injured person was a soldier, whom I was bound to attend; and moreover on former occasions he disallowed similar claims. This seemed plausible and conclusive; nevertheless, on my behalf, I contended that although my entire services were engaged by the Crown, they were only so engaged in one capacity—that of a M.O. in Her Majesty's Land Forces; for these services I received a certain daily rate of pay, in accordance with the R.W. under which I served, and that the public had no right to exact any other services from me without further remuneration; the only courts of law in which I was bound to give evidence under my military engagement were military courts, such as are under the jurisdiction of the War Office.

A colony has no claim on the services of a M.O. beyond his military duties; the fact of the injured person happening to be a soldier in the above case was beside the question. The evidence given was required in order to bring a transgressor of the criminal law to justice. I was paid, but it is very unpleasant to be obliged to move in such matters. The case is similar where evidence is required by a coroner's court.

**Assault—Definition.**—"A person is said to commit an *assault* if he intentionally applies force to the person of another, either directly or indirectly, without his consent, or even if he only attempts or threatens by some act or gesture to apply such force, provided that he either is able, or is reasonably believed by the other to be able, to at once effect his purpose. Mere words, however, will not constitute an assault."—*M.L.*

**Lawful Consent.**—Consent, to be an answer to a charge, must be *bonâ fide*, and not mere acquiescence. It should not be obtained by fraud or deception, or through a misapprehension of the nature of the act committed or attempted, or for the purpose of a breach of the peace, such as to inflict bodily harm. A charge of assault might also be answered by showing it was committed in self-defence, or to prevent a breach of the peace, or under the authority of the law.

"The intention with which the transaction is entered upon appears to determine the question of the criminality.

It is not essential to the establishment of an assault that actual injury should have been caused.

The following are a few examples of an assault:—

The act of depriving a person of his liberty.

Encouraging a dog to bite, thereby rendering a person liable to be bitten.

Striking at or throwing a missile at a person, although without hitting.

Striking a horse on which another person is mounted.

Throwing over a chair upon which a person is sitting or about to sit so as to injure him.

Striking at one person and hitting another is an assault upon both.

Inducing a female to allow the offender to undress her by a false statement that it is necessary to do so for medical reasons."

—*O'Dowd.*

**Punishments.**—A common assault is punishable by imprisonment up to *one* year; an indecent assault on a female, or an assault to commit a felony, or to resist lawful arrest, by *two* years' imprisonment. An assault occasioning actual bodily harm is punishable by *five* years' penal servitude.

No term of imprisonment can be awarded beyond *two* years. The minimum award of penal servitude is *five* years. A soldier convicted of a felony forfeits all medals, decorations, annuities and gratuities, and is, as a rule, discharged the service. A soldier may commit a felony with a view to getting his discharge.

*The Principal Felonies*, made so by statute, are—murder, manslaughter, attempt to murder, wounding with intent to do bodily harm, theft, burglary, housebreaking, rape, arson, forgery.

*The Chief Misdemeanours*—libel, conspiracy, nuisance, perjury. The same act cannot be both a felony and a misdemeanour.

Felonies, if not provided for in the Act, may be punished by seven years' penal servitude; a misdemeanour by fine and imprisonment, either with or without hard labour.

**Wounds and Injuries Defined.**—While an assault might be regarded as a minor offence against the person, the following are *definitions* of the more serious kinds of injuries of which the law takes special cognizance:—

These are injuries which cause, 1, death; 2, maiming; 3, disfiguring; 4, disabling; 5, grievous bodily harm; 6, wounding.

(1.) Injuries causing death will be specially mentioned hereafter.

(2.) A maim is practically any injury which makes a man less fit for fighting, as the loss of an eye or a limb, castration, etc.; but other injuries, however disfiguring, such as the loss of a nose, are not maims.

(3.) Disfiguring includes any external injury which detracts from the personal appearance.

(4.) Disabling is the doing something which creates a permanent disability, and not a mere temporary injury.

(5.) Grievous bodily harm need not be either permanent or dangerous; it is sufficient if it seriously interferes with the health or comfort of the person on whom it is inflicted.

(6.) A wound is a division of the whole skin covering any part of the body; thus a mere division of the cuticle or outer skin is not sufficient, but a division of the inner skin, where there is no cuticle, as within the lips, is sufficient. The wound may be made in any way, either by laceration, contusion, incision, puncture, or otherwise.

In every case where injuries of any of the above kinds are inflicted unlawfully and maliciously, an offence of greater or less gravity is committed.

In considering the offences involving these kinds of injury in detail, careful attention must be paid, first, to the extent and nature of the injury or danger caused; secondly, to the intention (if any) with which the act causing such injury was done; and, thirdly, to the special circumstances (if any) attending the act.

The simplest case of the kind is where a person has simply wounded or inflicted grievous bodily harm upon another unlawfully and maliciously; in such case he is, at the least, guilty of a misdemeanour, and liable to five years' penal servitude.

The crime, however, becomes much more serious if the offender wounds or inflicts grievous bodily harm upon another, or shoots or attempts to shoot at another *with intent* to maim, disfigure, disable, or do some grievous bodily harm to such person or any other person, or to prevent the lawful apprehension or detention of any person whatever; in such case the offender is guilty of felony, and liable to penal servitude for life.—*M.L.*



In the case of *grievous bodily harm* there is no external wound properly so called, such as incisions, punctures, lacerations, compound fractures, etc., but this class of mechanical injury includes contusions, concussions, sprains, dislocations, and simple fractures.

There are three questions common to all forms of mechanical injury: 1. Was it inflicted during life? 2. Was it the cause of death? and, 3. Was it accidental, suicidal, or homicidal?

It is worthy of note that a bruise may be caused on a body within two hours and a half after death. The absence of any inflammation or swelling about the parts, and, on cutting into it, the absence of clot or of effusion into the cutis, will assist in determining the time of its occurrence. Surgical knowledge will determine, in cases of fractures or wounds, as to whether they occurred during life.

**Incised** wounds gape on account of the contraction of the tissues. They commence abruptly and tail off gradually, thus indicating in many cases the direction in which the instrument was drawn. Hæmorrhage is the chief danger from these wounds.

**Punctured** wounds, if inflicted with sharp instruments, may bleed profusely. They are generally smaller than the weapon by which they were caused, and, as a rule, take its shape. Conical bullets sometimes make triangular openings like bayonet wounds, and, if they strike obliquely, they may produce valvular wounds.

**Causes of Death.**—All cases which operate to cause death suddenly by syncope, asphyxia, or coma, specially demand the attention of the medical jurist.

**Syncope** is ordinarily manifested in fainting or swooning when the heart is temporarily deprived of a sufficient supply of blood to maintain its action. It is necessary that blood be supplied in proper quantity and quality. Death from hæmorrhage is due to deficiency, while certain poisons or diseases cause the second condition.

**Asphyxia** or **Apnoea** is said to be the cause of death when death commences at the lungs, as in cases of suffocation or strangulation. When air is cut off from the lungs, the blood, not being aerated, in its impure state is supplied to the heart and brain, and stagnates in the capillaries of the lungs. Death from asphyxia has been regarded as death from "defect" of blood. After the brain and nervous system are paralysed from this defect, and their functions suspended, as in death, the heart continues to act and the circulation goes on for some minutes, although breathing has entirely stopped. A person asphyxiated is not necessarily dead—he may be resuscitated. It is with the cessation of the heart's action systemic death, or death of the body, occurs; thus the heart is considered the organ in which life begins and ends—"the first to live, the last to die."

**Coma** causes death when it commences at the brain, either from pressure on the brain or medulla oblongata, or a sudden arrest of the supply of blood, or an impure supply. Although complete insensibility may ensue from any of these causes, still the functions of the heart and lungs are not altogether arrested; they continue to act independently for a short time until paralysed from nervous influences being withheld.

The following notes of the post-mortem appearances due to these causes are from Taylor's "Manual":—

**"When Death takes place by the Heart,** the right and left cavities of this organ are found to contain blood in the normal proportion in which that fluid is ordinarily circulated. This retention of blood in these cavities arises from the sudden stoppage of the heart's contractions. Blood is found in the large veins (*venæ cavæ*), as well as in the arterial trunks. There is no congestion or accumulation of blood in the lungs or the brain.

**"In Death by the Lungs,** as the circulation of the blood is primarily arrested in these organs, the pulmonary artery, the right cavities of the heart, and the *venæ cavæ* are found gorged with blood. The pulmonary veins, the left cavities of the heart, and the aorta, are either empty or contain but little blood. In certain cases of asphyxia the right cavities of the heart, as well as the left, have been found empty. When the access of air to the lungs is suddenly and completely cut off, the circulation of the blood is very speedily arrested; but supposing the occlusion of the air-passages to be partial or gradual, the circulation of the blood may continue for a time, and thus cause congestion of certain organs. Hence the appearances in asphyxia differ greatly. A mixed condition under the name of syncopal asphyxia has been described by some pathologists. In this, the cavities of the heart are found empty.

**"In Death by the Brain,** the appearances observed consist chiefly in a congested state of the cerebral membranes and substance of the brain. As before death the breathing is affected, the lungs are congested, and blood accumulates in the cavities of the heart, more on the right than on the left side.

"The appearances described as characteristic of the different modes of death by the heart, lungs, and brain, are liable to variation by reason of the intimate relations of these organs. Thus, there may be a mixed condition of syncope and asphyxia, or of asphyxia with cerebral congestion.

"With regard to the interruption of the functions of the brain as a result of pressure by the effusion of blood or serum, it is to be observed that a very small quantity effused at the base or in the substance of the medulla oblongata is sufficient to cause death; while, generally speaking, a larger quantity is required to be effused in the membranes, ventricles, or substance of the brain in order to produce fatal results."

**Cooling of a Dead Body.**—Regarding cold as the absence of heat, when the vital power of producing heat has gone, what remains after death will be removed at a rate varying according to the condition of the body itself, whether fat or lean, as well as the temperature and conducting quality of its immediate surroundings. The cause of death may also exercise an influence in this matter. When it is due to asphyxia the cooling process is retarded. In death from cholera and yellow fever the temperature rises after death, on account of chemical action following rapidly on the removal of vital activity. Animal heat seldom continues beyond 12 hours. When the body is quite cold *rigor mortis* sets in, and lasts for about three days.

Apart from special conditions or complications, such as lesions of the brain, death from coma and asphyxia present much the same post-mortem appearances; the slower death comes on, the more these evidences approach each other, so much so, as to render it very difficult to say whether the primary congestion occurred in the nervous or respiratory system, or in which of these systems death commenced.

**Post-mortem.**—The mode of conducting post-mortem examinations in a methodical way, according to stated rules of procedure, is necessary to facilitate the matter; and in order to obtain the most reliable information and best results from the investigation, the observance of rules are as necessary here as in the case of evidence, and it may be again remarked that by adhering to the rules of evidence as the basis upon which to conduct all inquiry much is to be gained. In the ordinary intercourse of life, in the administration of affairs, or in matters of scientific research, rules may be modified according to circumstances; still, one is most likely to ascertain facts and obtain reliable information by systematic inquiry, facilitated by the observance of recognised rules. By practising these rules inquiry is expedited with accuracy, and those speculative conclusions avoided which in times remote did so much to retard the advancement of medicine as a science.

**Homicide.**—The following as to the law respecting homicide is from the Official Manual of Military Law:—

“A child is considered to become a human being as soon as it has wholly proceeded in a living state from the body of its mother, and has an independent circulation, whether it has breathed or not, and whether the umbilical cord has or has not been severed; and a person is responsible for killing such a child, though the injuries of which it dies were inflicted by him before or during birth; but a person is not responsible for killing a child which never becomes a human being, as if he kills it outright before or during birth, even though the child may have breathed.

**Criminal Responsibility.**—“In determining whether a person has killed another, the general principle applies that



a person is responsible for the consequences which naturally result from his conduct, but no further. Therefore, if a person injures another dangerously, he is responsible if death results, either from the injury itself directly, or from a neglect of proper treatment of the injury, or even from improper treatment of the injury, if it be applied in good faith for the purposes of cure. But if a person injures another in a manner which is not in itself dangerous, and which is only rendered dangerous by the application of improper treatment, and death results, then, inasmuch as the improper treatment is really the cause of the death, the person causing the injury is not responsible.

"Thus, supposing that a person is severely wounded; if he dies either from lock-jaw in consequence of his refusal to allow an operation which might probably have saved his life, or from the performance of an operation which competent surgeons considered advisable, even though it may not really have been necessary, the person inflicting the wound is responsible. If, on the other hand, a person is only slightly and not dangerously wounded, and an incompetent surgeon performs a severe and unnecessary operation which causes death, the person inflicting the wound is not responsible.

"A person is deemed to kill another even if he merely accelerates the other's death, and it is no excuse that the person killed would have died very shortly from some other cause. Thus, if a man strikes an invalid who could not possibly live more than six weeks, and the invalid dies sooner than he otherwise would in consequence of the blow, the striker is responsible for the death.

"It must be shown that the death was a *result* of the conduct of the accused person; that is to say, the death must happen within a year and a day from the day on which the accused committed the offence, or the last of the offences which are alleged to have caused it, as otherwise the law presumes that it must have proceeded from some other cause, and the accused cannot be made responsible for it. The death must also be the direct and immediate result of the conduct of the accused; but there is no hard and fast rule applicable in every case to determine whether such an immediate connection between the death and the conduct exists; and whenever a doubtful question does arise, it must be decided according to the circumstances of the particular case."

This year and a day rule is a practical one, although death from wounds or injuries may occur many years after the receipt of the injury; in such protracted cases generally the head or chest is the seat of injury.

To maintain a charge of homicide, death should be strictly and clearly traceable to the injury, and not dependent on any other causes. Slight external violence may prove fatal in certain affections of the heart or brain which would ultimately



cause death. It is deemed sufficient to prove that death was accelerated by the malicious act of the accused: *to accelerate death is to cause death.*

A person intending to take the life of another, if by mistake he should happen to kill a third party, he is guilty of murder. On the same principle we observe the ruling is founded that a private, while intending to strike a sergeant, hits another N.C.O. purely by accident, he is guilty of the offence of striking his superior officer. *See p. 18.*

**Medical Testimony.**—"It is important for a medical witness to bear in mind that in all cases of wounds criminally inflicted, the cause of death must be *certain*. No man is ever convicted upon mere medical probability. In general, there is only *one* real cause of death, although other circumstances may have assisted in bringing about a fatal result. Thus, a person cannot die of disease in the bowels and a stab in the chest at the same time, nor of apoplexy from disease and compression of the spinal marrow at the same instant. Hence it is our duty, when several apparent causes for death exist, to determine which was the *real* cause; and in stating it to the court, to be prepared to offer our reasons for this opinion. In most cases of local injury, when a person dies speedily, there will be no great trouble in settling whether disease or the injury was the cause. A difficulty may, however, exist when a person has recovered from the first effects of a wound, and has subsequently died. Besides, there may be cases in which the cause of death, in spite of the most careful deliberation, will be still obscure; or sometimes it may happen that the death of a person appears to be as much dependent on bodily disease as on an injury proved to have been received at the time he was labouring under disease. How is an opinion to be expressed in such a case? The course which I apprehend a medical witness ought to pursue, provided he has duly deliberated on the circumstances before he appears in court, and his mind is equally balanced between the two causes, is to state at once his doubt to the jury without circumlocution, and not allow it to be extracted from him in cross-examination."—*Taylor.*

**How do Wounds cause Death?**—Wounds may cause death either directly or indirectly. A wound acts as a direct cause of death when a person dies either immediately or very soon after its infliction, and there is no other cause internally or externally to account for death. The direct causes may be hæmorrhage, great mechanical injury to important organs such as are essential to life, and shock or concussion affecting the brain or spinal cord.

**Loss of Blood as a cause of Death.**—"Loss of blood operates by producing fatal 'syncope.' A quantity of blood escaping from a vessel, although insufficient to cause death by affecting the heart and circulation, may readily destroy life by destroying

the functions of the organ or part into which it is effused. Thus a small quantity effused in or upon the substance of the brain, or at its base, may prove fatal by inducing fatal compression; and, again, if in a case of wounded throat, blood should flow into the windpipe, it may cause death by asphyxia, *i.e.*, by stopping the respiratory process. In these cases it is obvious that the blood acts mechanically, and in respect to the last condition, a medical man, unless circumspection is used, may involve himself in a charge of *malpraxis*. If he allows the wound to remain open, the wounded person may die through hæmorrhage; if he closes it too soon, he may die through suffocation; and in either case the counsel for a prisoner will not fail to take advantage of a plausible objection of this kind.”—*Taylor*.

This exemplifies with what care and deliberation a M.O. should proceed in such cases, not alone in the interests of his patient, but also in order to save his own reputation.

**How much Blood should a Man Lose to cause his Death?**—The absolute quantity of blood required to drain off and be lost in order to cause death depends on many circumstances, and has been differently estimated—from 5 to 8 pounds, or a lesser quantity, is sufficient to prove fatal to adults. The rapidity with which the blood escapes exercises a considerable influence, as well as the age, sex, and bodily condition of the wounded person. In contused, punctured, and gunshot wounds but little blood may escape externally, yet the internal effusion may rapidly cause death; again, in wounds involving the heart and lungs, the pressure due to the effused blood, more than its actual loss from the vessels, may prove fatal. The conditions referred to may be combined in any case, and so hasten a fatal issue; or, on the other hand, they may react on one another, and so exercise a compensating influence, and in this manner prolong existence.

**Diseases connected with Wounds in their Legal Aspect.**—**Tetanus** sometimes occurs as a secondary consequence of wounds, especially if lacerated or contused, involving nervous or tendinous structures; it may arise from slight bruises or injuries. “The M.O. is bound to exercise great caution before he pronounces an opinion that a fatal attack of tetanus has arisen either from spontaneous causes or from slight blows or personal injuries.

“**Erysipelas**, like tetanus, may be a fatal result of slight injuries. Wounds affecting the scalp are liable to be followed by this disease. Burns and scalds sometimes prove fatal through this secondary cause. Some constitutions are particularly prone to erysipelatous inflammation, and thus wounds comparatively slight may have a fatal termination. When a wounded person has died from this disease, an assailant cannot be made responsible for the fatal result unless the erysipelas is clearly traced

to the injury. The medical facts that the person assaulted has never recovered from the effects of the violence, and that the inflammation set up has suddenly assumed an erysipelatous character, are sufficient to establish this connection. If there has been recovery, and an interval of some days has elapsed, a doubt may arise respecting the connection of the erysipelas with the violence inflicted. This disease is occasionally idiopathic, *i.e.*, it appears, like tetanus, without any assignable cause.”—*Taylor*.

**Death while under Treatment.**—Death may occur from surgical operations performed *bonâ fide* for the relief of the injured person. If death takes place from an unskilful operation, and it can be clearly traced to the operator, the responsibility of the doer of the injury ceases. Should death occur under chloroform, it should be shown that it was a *necessary part of the treatment, and skilfully and properly given after careful examination of the patient, to justify the propriety of administering it.*

The assumption that a surgical operation was necessary in the treatment of the case or it would not have been undertaken is not sufficient—it may not be accepted; the court would then deal with the case on the evidence before it. In criminal cases the M.O. should, if possible, obtain the advice and assistance of others.

Malice may be of a passive character, as, for instance, in the case of manslaughter by a surgeon who through gross incompetency causes death. “Here the criminality consists in wilfully incurring the risk of causing suffering to others.”

Doing a dangerous act may be a crime, even though the offender has no criminal intention whatever; injuring persons by furious driving, or by negligence on the part of railway employes, would be cases of this kind.

Every M.O. in the army is responsible for the correct treatment of his patients, and would be justified in disobeying the command of his superior officer with regard to their treatment, but *only* in cases where the treatment ordered, if adopted, would lead to an *irreparable result*. See sec. 9, A.A.

The most skilfully performed operations may cause death independent of the injury. The legal bearings of questions in connection with the subject of wounds are so interesting to the army surgeon, and so important, that I am induced to quote the following from Dr. Taylor’s clear and authoritative writings:—

“Death is by no means an unusual result of severe operations, the secondary consequences under which the patient may die being very numerous, even when the case is most skilfully managed. Sometimes the patient will die on the table, although but little blood may have been lost. Fear, pain, and sudden shock to the nervous system, have caused death under these circumstances. The most common indirect causes of death after severe operations are secondary hæmorrhage, erysipelas, tetanus, delirium tremens,

pyæmia, and hectic fever with gangrene of the stump. Mr. Travers observes that, 'a pre-existing disease of the liver, kidney, or testicles, though chronic, and in itself not alarming to the constitution, becomes a drag upon its elasticity, and stands in the way of recovery. Inspection of the body after death frequently explains the unfavourable result of operations that promise well, by discovering one or more organs in a state of chronic disease which had not previously deranged the health in a degree sufficient to give notice of its existence, and which might, therefore, have remained quiet for years to come had no extraordinary call been made upon the powers of the system.'

"Should the operation be considered to be *absolutely* required for the treatment of a wound, which, according to all probability, would prove mortal without it,—should it be performed with ordinary skill, and still death ensue as a direct or indirect consequence, it is only just that the person who inflicted the injury should be held responsible for the result."

**Consent to Surgical Operation.**—The consent of a person to undergo a surgical operation should if possible be obtained. When the sufferer is unable to give his consent, and a surgical operation is *reasonably and properly performed for his benefit*, and then should killing or maiming be the result, consent is presumed, and the surgeon is not liable for the consequences. Of course by the defence an endeavour may be made to show that the operation should not have been undertaken, or that there was a want of forethought, precaution and skill, and, taken altogether, a certain recklessness about the proceedings. On the other hand it might be contended, had no surgical interference taken place, that the deceased died not from the injury, but through neglect and incompetency on the part of the surgeon. See p. 72.

**Neglect to Perform an Act or a Duty.**—"A person is not ordinarily considered to cause injury to another by the mere omission or negligent performance of an *act*; thus, if a man sees another drowning and is able to save him by holding out his hand, but omits to do so, even *in the hope* that the other may be drowned, still he is not criminally responsible."—*M.L.*

But the law further says—"every person who has *charge* of another, *e.g.*, a lunatic or prisoner, is bound to provide him with necessities if he is so helpless as to be unable to provide himself, and if death results from a neglect of such *duty*, the person in charge will be responsible unless he can show some good excuse."

The responsibility of a person who undertakes to perform a duty, such as a sentry or an orderly, has been before pointed out (p. 16), but it may be further added—"if a person *undertakes* to do any act, the omission of which may endanger human life (as, for instance, the turning of points on a railway), and omits to discharge that duty without lawful excuse, he is responsible for



the consequences. Again, if a person undertakes (except in cases of necessity) to administer surgical or medical treatment, or to do any other act which may be dangerous to human life, he is responsible if death results from a want of reasonable care and skill on his part."—*M.L.*

**Secondary Causes of Death.**—"A person who recovers from the immediate effects of a wound may die from fever, inflammation or its consequences, pyæmia, erysipelas, delirium tremens, tetanus or gangrene; or an operation required during the treatment of a wound may prove fatal. These are what may be called secondary causes of death, or secondary fatal consequences of a wound. The power of deciding on the responsibility of an accused person for any event which depends only in an indirect manner on an injury originally inflicted by him, rests of course with the authorities of the law. But it is impossible that they can decide so difficult and nice a question in the absence of satisfactory medical evidence; and, on the other hand, it is right that a medical witness should understand the importance of the duty here required of him. *Fever* or *Erysipelas* may follow many kinds of serious wounds, and in some few instances be distinctly traceable to them; but in others, the constitution of a person may be so broken up by dissipated habits as to render a wound fatal which in a healthy subject might have run through its course mildly and have healed. When the fever or erysipelas can be traced to a wound, or there is no other apparent cause of aggravation to which either of these disordered states of the body can be attributed, they can scarcely be regarded by a medical practitioner as unexpected and unusual consequences, especially when the injury is extensive, and seated in certain parts of the body, as in the scalp. If death takes place under these circumstances, the prisoner will be held as much responsible for the result as if the wound had proved directly mortal."—*Taylor.*

It is a principle in law that every person is responsible for the consequences of his acts, and even beyond the law this is admitted with respect to moral obligations. Thus when death can clearly be shown to be the result of an illegal act, although an after-effect or secondary consequence of the original injury or exciting cause, when so intimately connected with it in the sequence of cause and effect as to place the matter beyond all reasonable doubt, the person who inflicts such a fatal injury is deemed guilty of causing the death, however many circumstances in connection with a case of this kind may tend to materially lessen the amount of punishment which would otherwise be awarded.

**Indirect Fatality from Wounds and Injuries.**—Comparatively slight wounds or injuries in persons in an unhealthy or an unsound condition at the time of their infliction may have a fatal termination; and, judged by the ordinary standard of health and vigour, this must be regarded as an unusual and unexpected

occurrence. Where the deceased may have had a rupture or some other physical defect, although otherwise healthy, a kick or blow over the parts thus deranged may in an unforeseen and secondary manner cause death. Further, some persons, although in good health, through constitutional defects succumb to comparatively slight injuries on account of their secondary consequences. Again, abnormal formations, such as an unusually thin skull, being insufficiently strong to resist a blow struck with moderate force, may indirectly lead to a fatal result. Such physical and constitutional conditions in a medico-legal aspect may be regarded in their relation to the injury inflicted after the manner an idiosyncrasy is with respect to a poison. Although to accelerate death is to cause death, when death occurs in connection with such bodily peculiarities which are entirely beyond the knowledge of the accused, and for which he is in nowise responsible, on conviction, in the absence of malice, punishment will be awarded proportionately according to the circumstances of the case.

**"Delirium Tremens** is a disease which frequently presents itself as a secondary consequence of injuries to persons of intemperate habits. Whether the injury be slight or severe, this disease may equally supervene and prove fatal. It is observed occasionally as a consequence of operations required for the treatment of wounded persons."—*Taylor*.

**Traumatic Delirium** as a complication of wounds is occasionally met with. "The difference between it and delirium tremens from excessive alcoholic drinking," observes Sir Thomas Longmore, "is chiefly marked by the absence of the trembling condition of the limbs."

Traumatic delirium and delirium tremens are emotional diseases; the one is due to physical causes, the other to toxic influences. Traumatic delirium is a condition predisposed to or excited by vicissitudes which simultaneously exercise their influences on the mind and body, such as deprivation of rest, or being harassed by reason of night alarms and night watching, as a military duty, where there is great responsibility, coupled with a foreboding anxiety. Under such conditions the imagination is unduly exercised, and the feelings or emotions are in a state of exceptional activity. Although controlled by the will, yet it is between the co-ordinating power of these faculties, when weakened by physical conditions, that the chief strain occurs, and which is too easily and completely upset by the shock of injury. When the balance of power is no longer maintained, the derangement is manifested after the manner of delirium tremens. Whenever men are exposed to night watching under depressing circumstances, it would be well to recommend that the sentries should not remain long on their posts.

With the spoils of war the victor gets D. T., while the portion of the vanquished is traumatic delirium.

A soldier who drinks alcohol to such an extent as to produce delirium tremens is liable to be punished for so doing, as it is considered "conduct to the prejudice of good order and military discipline." Excessive drinking, known only by its effect, cannot be otherwise dealt with as a crime under the A.A.

**Criminal Responsibility in Delirium Tremens.**—At a circuit of the High Court held at Glasgow, Elizabeth Short, wife of a sergeant in the Highland Light Infantry, was charged with culpable homicide. The indictment ran that, between July 6th and 11th, 1889, in the residence of her husband at Hamilton Barracks, she neglected to provide with necessary food, clothing, and nursing her infant son, in consequence of which he died on July 11th, and was thus killed by her.

The medical evidence went to show that the mother was suffering from alcoholism, and, a few days before the child's death, from delirium tremens. Lord Young said—"In this case there was no intention to injure, and he must rule that there was no proof of any crime." See pp. 73, 74.

"This is the most radical action which has been taken by any judge in dealing with a charge of an alleged criminal offence complicated with delirium tremens, and it is a further development of a series of recent remarkable deliverances by our administrators of criminal law. Mr. Justice Day ruled 'that whatever the cause of the unconsciousness, a person not knowing the nature and quality of his acts is not responsible for them' (Reg. v. Baines, 1886). Chief Baron Palles ruled 'that if any one, from long watching, want of sleep, or deprivation of blood, was reduced to such a condition that a smaller quantity of stimulant would make him drunk than would do so if he were in health, then neither law nor common sense could hold him responsible for his acts' (Reg. v. Mary R., 1887). Baron Pollock ruled 'that if at the time an alleged murder was committed (though the prisoner had been a drunkard and had had delirium tremens) he had taken only such a quantity of intoxicating liquor as an ordinary man could take without upsetting his reason, an insane predisposition being the main factor, although the drinking of a small quantity of alcohol was the contributory cause, the plea of irresponsibility was good' (Reg. v. Mountain, 1888). These judicial utterances, capped by Lord Young's declining to send the case of Elizabeth Short to the jury, really portend a revolution in our criminal jurisprudence."—*British Medical Journal*, 19 October 1889.

**Suffocation**, whether due to disease, accident, or wilful violence, is said to occur when the respiratory process is directly impeded by internal causes. When external pressure on the trachea is the cause of death, it is said to be due to strangulation, throttling, or hanging. Death by drowning is a form of suffocation, so is smothering. Death by any of these means is occasioned by asphyxia, but subject to variations.

**Garotting** is thus defined in the Manual M.L.:—"Garotting, that is,

An attempt by any means whatever to choke, suffocate, or strangle any person; or

An attempt by any means whatever which are calculated to choke, suffocate, or strangle, to render any other person insensible or incapable of resistance; or

An administering or attempting to administer to any person any drug or stupefying matter, with the *intention* of enabling the offender to commit, or to assist someone else in committing, some indictable offence, is a felony, and punishable with penal servitude for life."

**Asphyxia** has been divided into three stages:—

1. Voluntary and instinctive efforts at respiration under guidance of sensibility.
2. Insensibility, with irregular spasmodic efforts and convulsions.
3. Cessation of all efforts and all outward signs of life.

The heart's action and the circulation will go on from 5 to 10 minutes after the commencement of the obstruction to the respiratory functions to which the defective oxidation of the blood is due. Regarding this obstruction as the primary cause, **Apnoea** is considered the more correct term, still asphyxia is the one most commonly employed. Probably life has never been restored after 10 minutes from the cessation of the respiratory process.

In cases where individuals are suddenly bereft of life while the mind is abnormally strained in a struggle to gain the mastery over an adversary, it has been found that the body often retains the attitude assumed at the moment of death: this condition is frequently observed on the battle field. It is possible in all such cases where persons are, as it were, "snuffed out," that asphyxia in its broadest sense is the immediate cause of death, the fatal shock leaving no time for the 2nd and 3rd stages to occur in the rapid transition from life to death. Thus the vital powers under guidance of the will are strangely manifested in death when complete and sudden cessation of the respiratory functions and vital activity occur through injury of the medulla oblongata or respiratory tract.

**Drowning.**—Instructions for the treatment, by means of artificial respiration, etc., of persons who have been drowned, are given in Part II. of the M.R.

Death by drowning may be due to many causes in combination with the asphyxia which must always occur in order to constitute drowning. Thus death by drowning is frequently mixed with or due to apoplexy, shock, syncope, or exhaustion; these will materially influence after-death appearances.

One of the most constant signs of death by drowning is engorgement of the right cavities of the heart and *venæ cavæ*. A fluid state of the blood is usually found in death by asphyxia or coma.



To determine whether a body was placed in water after death, or whether death was due to drowning, special signs are given by Prof. Ogston as indicative of the latter assumption; these he places according to their relative degree of importance thus:—

1. Watery froth about the lips and nostrils.
2. Similar froth in trachea, bronchi, and air cells of the lungs.
3. Water in the trachea and air cells of the lungs, with or without the admixture of mud, sand, or weeds.

4. Water in the stomach. Then come in as corroborative signs—the cutis anserina, the cholera hand, the blanched and plaited skin of the hands and feet, excoriations about the knuckles and points of the fingers, dirt or sand under the nails, and foreign bodies grasped in the hand: among the latter might be found the proverbial straw. The signs of any accessory injuries to the body should be looked for. The longer the first stage of asphyxia lasts, and the greater the struggle against fate—the more frequently a person gains the surface and draws in water and air together—the more apparent will be the characteristic signs of drowning in the dead body. Probably water does not enter the stomach after death, unless the body happens to have remained for a long time in the water. A dead body found in water, when turned face down and pressed over the stomach, should no water come from the mouth, it is negative evidence of much value that the deceased was not drowned. It is worthy of note that the greenish cadaveric discolouration in a body submerged almost invariably commences on the chest, otherwise it first appears over the abdomen.

In cases of hanging and strangulation, there are no specific signs in internal organs—they are those of asphyxia. There is the same congested state of the base of the tongue and turgescence of the head, face, and conjunctiva. Marks on the neck may be produced after death; these marks may not develop for 6 or 8 hours after hanging, and are of a greenish brown colour, rather than dark livid marks.

It is well known that some internal organs of the body undergo post-mortem changes more rapidly than others. The trachea, it must be remembered, so rapidly undergoes such changes as to lead to an error in supposing, at first sight, that suffocation or drowning may be the cause of death. In the stomach the first trace of putrefaction appears from 4 to 6 days after death; about the same time the intestines become involved. The blood vessels and the adult brain are the last to undergo change.

**Procuring Abortion.**—The offence of procuring abortion is thus stated in the Manual M.L.:—

If a woman *who is with child* unlawfully takes any poison or other noxious thing, or uses any instrument or other means whatever, with intent to procure her own miscarriage, or

If any person intending to procure the miscarriage of some woman, whether *she is or is not actually with child*, unlaw-

fully causes her to take any poison or other noxious thing, or uses any instrument or other means whatever with that intent;

this is in either case a felony, and punishable with penal servitude for life; of course if the treatment was rendered necessary by the state of the woman's health, and employed according to the usual practice of medicine it would not be unlawful.

**Poisoning.**—"Toxicology, as legal medicine, has become a distinct science embraced within medical jurisprudence. A person who unlawfully causes another to take poison or any other noxious thing with intent that he may be injured, aggrieved, or annoyed, is guilty of a misdemeanour, and liable to five years' penal servitude, and this whether or not the object is attained. But if a person unlawfully causes another to take poison, and thereby endangers his life or inflicts grievous bodily harm, this amounts to felony, and is punishable with *two* years' penal servitude."

In army hospitals the medicines are placed under the immediate charge of the compounder and Q.M., who are responsible for their proper care and custody to the M.O. in charge. All drugs of a specially poisonous nature are to be kept under lock and key in a cabinet set apart in the surgery for the purpose. The following (which are supplied in fluted glass "poison" bottles) are specially mentioned in the M.R. as requiring safe custody:—Atropine, elaterium, hydrarg. perchlorid, morphia, strychnia, veratria, creosote, croton oil, hypodermic injection of morphia, and dilute hydrocyanic acid.

It is a good plan, I always adopt, to place a table of the contents of this cabinet on the door, with the dose and antidote for each drug in the cupboard written on it. This may prove useful in case of a poisonous dose being given, or in case of any such misadventure. Care should be taken that the compounder does not keep other medicines in the cabinet than those for which it is intended, otherwise the primary object with which it is employed will be defeated.

A table of poisons and their antidotes is given in the M.R., Part II. A copy of these regulations is supplied to every N.C.O. and man in the M.S.C.

A compounder of medicine in the M.S.C. has no qualification beyond the War Office authority for the dispensing of medicine. This authority is limited to those persons under the jurisdiction or official recognition of the War Office, and who are thus entitled to receive medicine out of the public stock; it therefore behoves those N.C.Os. to be particularly careful about dispensing for persons outside War Office recognition and beyond the sphere of their own duties. Should the compounder appointed to dispense medicines in a military hospital delegate his duty without due authority, it is an offence triable under sec. 40 A.A.;

further, in the event of any mistake or misfortune occurring in connection with the duties thus unlawfully delegated he will be held responsible. Apart from these and other considerations, in case of any misadventure, a compounder of the M.S.C. probably will not be protected to the same degree before a jury by his qualification, as a licensed apothecary would be under similar circumstances.

**Definition of a Poison.**—Taylor says—“A poison is a substance which, when absorbed into the blood, is capable of seriously affecting health or of destroying life.” It does not matter as to the physical condition of the substance, whether a solid, liquid, or gas, or whether it is absorbed through the stomach, bowels, lungs, skin, or a wound, or in any way whatsoever. “Thus arsenic is a poison, whether it enters the blood through the lungs, the skin, or the stomach and bowels; but such poisons as those of the cobra, the viper, of rabies, and of glanders, appear to affect the body only through a wound. When introduced into the stomach, some of these animal poisons have been found to be inert.” The flesh of diseased animals when eaten is an example of a poison of this sort being rendered incapable of reproducing disease after undergoing a metamorphosis in the process of digestion. See p. 237.

The boundary between a medicine and a poison is undefined; by its mode of administration, as well as on account of the quantity taken at any one time, a medicine may become a poison. Tartarized antimony, for instance, if taken in frequently repeated medicine doses, will destroy life; and so it is with arsenic and many mineral sorts. They may easily be converted into poisons by the employment of small doses at short intervals.

A substance which affects a person through idiosyncrasy of constitution, but which does not affect another person, does not appear to be, *legally speaking*, a poison. Thus what is one man's food cannot in this sense be regarded as another man's poison, although it may disagree with him intensely, and from a physiological point of view produce a like effect. So, in a strict sense, mechanical irritants, pounded glass, small nails, or any such “*destructive things*” are not poisons, although they may cause grievous bodily harm, or bring about the same result as if they were poisons introduced into the system. A pure alkali, a strong acid, or a corrosive salt, which when taken internally would cause corrosion or chemical decomposition, might not legally constitute a poison. Thus a substance which acts as a poison *medically speaking*, may not be regarded as a poison *legally speaking*.

“In reference to the *medical* definition of a poison, it is necessary to observe that the law does not regard the manner in which the substance administered acts. If it be capable of destroying life or of injuring health, it is of little importance, so far as the responsibility of a prisoner is concerned, whether its action

on the body is of a mechanical or chemical nature, and whether it operates fatally by absorption into the blood or not.”—*Taylor*.

A poison to be one must have *inherent qualities as such*, without regard to physical conditions, costic properties, etc.; for instance, the chemical or mechanical condition of a thing or its temperature may cause it to act *as* a poison, still it is not a poison. Thus water taken either too hot or too cold may cause death; when hot it is merely a vehicle for heat, while, on the other hand, its coldness is due to the absence of heat.

**A noxious thing** must have such inherent qualities or specific attributes as to render it noxious in the particular case in which it is used; for instance, if a person was indicted for the administration of ergot of rye to a woman, with the criminal intention of producing abortion, if it so happened that the woman was not in the family way, it would knock the bottom out of the proceedings, as under such circumstances the drug would be a *harmless thing*.

**Classification of Poisons.**—In the classification of poisons, an endeavour has been made to combine two systems, and thus arrange them according to the kingdom of Nature from which they are derived, and the physiological effects of each group. This is no easy matter. Thus there would be, *Inorganic*—corrosive and irritant; and, *Organic*—irritant, and such as destroy life through their action on the brain, spinal cord, heart or lungs.

Taylor adopts a classification as follows:—

“Poisons have been divided into three classes, according to their mode of action on the system; namely, **Irritants, Narcotics, and Narcotico-Irritants**. This classification is a modification of that originally proposed by Orfila. The narcotics and narcotico-irritants may, however, be regarded as constituting one large class—the **Neurotics**—as their special action is to affect directly one or more parts of the nervous system. The neurotic poisons admit of a sub-division into cerebral, spinal, and cerebro-spinal, according to whether the poisonous substance affects directly the brain, the spinal marrow, or both of these organs.

“**Irritants.**—The irritants are possessed of these common characters:—When taken in ordinary doses, they occasion speedily violent vomiting and purging. The symptoms are either accompanied or followed by pain in the stomach and bowels. The peculiar effects of the poison are manifested chiefly on these organs, which, as their name implies, they irritate and inflame.

“**Difference between Corrosive and Irritant Poisons.**—As a result of the action of *corrosive* poisons, symptoms are commonly manifested immediately, because mere contact produces the destruction of a part. In the action of the purely *irritant* poisons, the symptoms are generally more slowly manifested, rarely showing themselves until at least half-an-hour has elapsed from the time of swallowing the substance. Of course, there are exceptions to this remark; for sometimes irritants act



speedily, though rarely with the rapidity of corrosive poisons. It is important in a practical view to ascertain whether, in an unknown case, the poison which a person requiring medical treatment may have swallowed is irritant or corrosive. This may be commonly determined by a knowledge of the time at which the symptoms appeared after the suspected substance was taken. We may thus often easily distinguish between a case of poisoning from arsenic and one from corrosive sublimate. There is also another point which may be noticed. As the corrosive substance exerts a decidedly chemical action, an examination of the mouth and throat may enable us in some cases to solve the question.

“There are many irritant poisons which have no corrosive properties, but every corrosive may act as an irritant. Thus the action of corrosive sublimate is that of an irritant poison, as, while it destroys some parts of the coats of the stomach and intestines, and irritates and inflames others. So, again, most corrosive poisons may lose their corrosive properties by dilution in water, and then they act simply as irritants.”

**Evidences of Poisoning.**—These have been placed under five heads—1, Evidences from the *Symptoms*; 2, from *Post-mortem Appearances*; 3, from *Chemical Analysis*; 4, from *Experiments on Animals*; and 5, *Moral Evidences*.

The two first of these evidences are the only ones that can be touched upon here. Moral evidences are of such a nature as to cast suspicion or give a clue. They tend to show a guilty knowledge on the part of the accused by reason of his actions or expressions in relation to the matter. See p. 52.

**Evidences from the Symptoms.**—“These relate to the mode of action of the poison, and this may be divided into local and remote. The local action is by irritation or corrosion; the remote action is due to the specific effects of the poison after its absorption. This effect may be common to a class or special to a poison. For instance, corrosive poisons give rise to collapse, such as occurs in cases of severe injury, while arsenic, by whatever means it gets access to the system, will inflame the lining membrane of the alimentary canal. This is its specific action. Its immediate action would be to cause burning pains about the abdomen, spasms, and cramp. Many poisons may thus be recognised by their special affinity for certain organs or systems upon which they are known to exercise a specific action. Narcotic poisons, as a class, act on the nervous system, the brain, and spinal cord. They have been grouped into three sub-classes, according to their mode of action. Of the first opium is typical, the second belladonna, and the third alcohol. When taken in poisonous doses they produce headache, giddiness, stupor, numbness, paralysis, and sometimes convulsions, rarely vomiting.

“Stupor points to the action of some member of the narcotic class; delirium to the class which comprises belladonna, hyoscyamus, and stramonium; paralysis, or great loss of muscular

power, to the action of hemlock, tobacco, digitalis, aconite, or the Calabar bean; tetanic spasms would lead us to infer the action of strychnine; arsenic sets up inflammation in the mucous membranes; mercury attacks the salivary glands and mouth; cantharides, the urinary system; antimony, the lungs; manganese and copper, the liver; chromate of potash, the conjunctiva; iodine, the lymphatic glands; lead, the muscular system; phosphorus promotes fatty degeneration, and spurred rye produces gangrene of the limbs.

“Poisonous substances used in the arts also reveal themselves through their specific actions. Thus the dropped hand betrays the use of lead; paralysis agitans, that of mercury; gangrene of the jaws, that of phosphorus; and a peculiar rash about the nostrils, ears, bends of the arms, and scrotum, that of the arsenite of copper.

“These statements might lead to serious mistakes if it were not understood that some constant symptoms of the poisons just enumerated are also occasional symptoms of other poisons. Thus tetanic spasms, though characteristic of the action of strychnia, may occur in poisoning by morphia and other of the alkaloids, as well as by arsenic, corrosive sublimate, and tartar-emetic. Salivation, again, may result from poisons other than mercury, and the dropped hand from the preparations of arsenic as well as from lead. Nor should it be forgotten that these are but the leading phenomena among a considerable group of less characteristic symptoms.”—*Drs. Guy and Ferrier.*

**Opium.**—Nearly half the cases of poisoning which occur are due to opium.

A full dose of opium is 2 grains, of the extract 1 grain, for an adult; the dose for an infant—none. Habit has much to do with the amount of opium that can be taken without producing a poisonous effect; this influence of habit is chiefly confined, almost limited, to poisons derived from the organic kingdom.

The diagnosis of opium poisoning from apoplexy or sunstroke is at times extremely difficult—almost impossible it may be—where there is no history of the case or early symptoms, the patient being found lying insensible. If the person can be roused, the case is not one of cerebral hæmorrhage; one-sided convulsions, spasms, or hemiplegia, and unequally dilated pupils indicate hæmorrhage. Pressure on the pons varolii may produce contracted pupils, while in cases of opium poisoning the pupils are not always found contracted.

In the event of a fatal issue, an inference may be drawn from the time which elapsed between the occurrence of the first symptoms and death. Opium never destroys life instantaneously or within a few minutes, as sometimes occurs in cases of apoplexy or heart disease. The only poisons which may act with such rapidity are prussic acid or nicotine. In opium poisoning, coma

comes on in from half to one hour, and generally kills in from 3 to 6 hours; if the patient survives 12 hours there is a good hope of his recovery.

**“Narcotico-Irritants** (*Spinal and Cerebro-spinal Poisons*)—*Taylor*. Poisons belonging to this class have, as the name implies, a compound action. They are chiefly derived from the vegetable kingdom. At variable periods after they have been swallowed, they give rise to vomiting and purging, like irritants; and sooner or later produce stupor, coma, paralysis, and convulsions, owing to their effects on the brain and spinal marrow. In the state of vegetables, as leaves, seeds, or roots, they possess the property, like irritants, of irritating and inflaming the stomach and bowels. As familiar examples we may point to *nux vomica*, monkshood, hemlock, and poisonous mushrooms. This class of poisons is very numerous, embracing a large variety of well-known vegetable substances, but they rarely form a subject of difficulty to a medical practitioner. The fact of the symptoms occurring after a meal at which some suspicious vegetables may have been eaten, coupled with the nature of the symptoms themselves, will commonly indicate the class to which the poison belongs.”

Taylor further states the principal points which demand the attention of a medical jurist in all cases of suspected poisoning. With respect to rules as to what to observe and record in such cases, he says, “The utility of any rules for investigating cases of poisoning, depends entirely on the judgment and discretion with which they are applied to particular cases.

“It is well to bear in mind, in conducting these inquiries, that symptoms resembling those produced by an irritant poison may be sometimes traced to *food*. Meat rendered unwholesome by disease or decay, pork, bacon, sausages, cheese and bread, as well as mussels and other kinds of shell-fish, may give rise to symptoms of poisoning, and even cause death. Such cases may be regarded as poisoning by animal or vegetable irritants. All the characters described as indicative of poisoning may be observed, and the difficulty of forming an opinion is often increased by the fact that some of the persons attacked may have previously partaken of the same kind of food without inconvenience.”

**In a Case of Poisoning, after what time does Death occur?**—In answer to this question Taylor states the average of results, thus—“The time at which death takes place after the first occurrence of the symptoms should be noted, because the more common poisons, when taken in fatal doses, generally cause death within definite periods of time. By attention to this point we may, in some instances, be enabled to negative a charge of poisoning, and in others to form an opinion of the kind of poison which has been taken. In a court of law, a medical practitioner is often required to state the usual ‘periods of time’ within which poisons

prove fatal. It is to be observed that not only do poisons differ from each other in this respect, but the same substances, according to the form or quantity in which it has been taken, may differ in the rapidity of its action. A large dose of prussic acid, *i.e.*, from half an ounce to an ounce, may destroy life in less than two minutes. In ordinary cases of poisoning by this substance, a person dies, *i.e.* all signs of life have commonly ceased, in from ten to twenty minutes; if he survives half an hour, there is some hope of recovery. In the cases of seven epileptics, accidentally poisoned by a similar dose of this acid in one of the Parisian hospitals, the first died in about twenty minutes, the seventh survived three-quarters of an hour. Oxalic acid, one of the most energetic of the common poisons, when taken in a dose of from half an ounce to an ounce, may destroy life in from ten minutes to an hour; if the poison is not perfectly dissolved when swallowed, it is a longer time in proving fatal. The strong mineral acids, in poisonous doses, destroy life in about eighteen or twenty-four hours. Arsenic, under the form of arsenious acid (white arsenic), operates fatally in from eighteen hours to three or four days. It has, however, in more than one instance, killed a person in two hours."

**Oxalic Acid**, although classed as corrosive, is poisonous when so largely diluted as not to be so, or even irritant; it acts on the brain after absorption into the blood. Its taste is so highly acid as to render it extremely difficult to conceal it. Crystals of oxalic acid may be mistaken for sulphate of magnesia or common salts, used as a cathartic. If a pen dipped in writing ink is touched to a crystal of oxalic acid it will turn red. Three drachms have caused death in one hour. Lime is the best antidote, as it forms an insoluble oxalate of lime. Vomiting should be encouraged; water, or potash, or soda should not be given.

**Evidences from Post-mortem Appearances.**—With respect to the evidences of poisoning to be derived from post-mortem appearances, without leaving any noticeable changes in the body, both narcotic and irritant poisons may destroy life; but it is generally found in the one case that there is congestion of the vessels in the brain, and in the other inflammation of the stomach or its consequences. Antimony may prove fatal, and be entirely eliminated from the system by means of the excretions a week before death. Belladonna, hyoscyamus, stramonium, Indian-hemp, aconite, hemlock, and poisons of a similar nature, leave no characteristic appearances.

Redness of the mucous membrane of the stomach, resembling what occurs in arsenical poisoning, may be found, although not due to any irritant poison, or dependent on disease, or connected with any symptoms of disorder of the stomach before death. Ogston directs attention to the circumstance that the stomachs of drunkards are sometimes found intensely red, or, what is more usual, becoming so on exposure to the air. While



many cases of this description are involved in obscurity, it is worthy of note that putrefactive infiltration from the blood in the spleen or adjacent organs will produce a reddish appearance in a stomach, otherwise in a normal condition. Taylor says—"The redness of the lining membrane of the stomach, in cases of poisoning, is so speedily altered by putrefaction, when circumstances are favourable to this process, as frequently to render it impossible for a witness to speak with any certainty upon its cause."

It has been observed that post-mortem redness is limited to the course of the vessels, and that from inflammation from disease or poison is diffused, but limited to the inflamed membrane; while in redness due to putrefaction, the colour pervades the whole of the tissues of the part. This, of course, is a distinction one would naturally expect—it should be looked for. Parts which have undergone inflammation putrefy more readily than their surroundings; still it is worthy of note that mineral poisons, such as arsenious acid, corrosive sublimate, and chloride of zinc, preserve the tissues with which they are in contact. As a rule, where the redness of the stomach or bowels is accompanied by a softening and a thickening, with a tenaceous mucous covering the membrane, the condition of the parts is due to an inflammation.

The fact that the following post-mortem appearances do occur, and to what causes they are due, is so well known to M.Os. as to render any reference to the matter here almost quite unnecessary; still the vast importance of the subject will be my plea of justification for trespassing thus further upon these medico-legal matters.

**Ulcers of the Stomach.**—These ulcers are due to excessive inflammation. They occur in small round patches. Ulceration is seldom the result of poison, but when it does occur from this cause the inflammation is diffused, and the arsenic may be found adhering to the edge of the ulcer. Ulceration from disease is of far more frequent occurrence. It is very insidious in its action, going on for weeks with but little gastric disturbance. On the other hand, when due to arsenic or other irritant poison, the symptoms are severe. *Ulceration* is a vital process whereby the tissues are absorbed; thus time is required for their removal. *Corrosion*, on the other hand, is due to chemical action, which causes rapid decomposition.

**Softening of the Stomach.**—Softening of the coats of the stomach occasionally occurs as the result of corrosive or irritant poisons, structural changes during life, or the solvent action of the gastric fluids after death. When due to poison, there are signs in the throat or internal organs of its action, but the poison must be detected. When softening is due to disease, it is confined to the stomach and to its cardiac end. When there is no sign or history of disease, and no poison can be discovered, the softening is presumably an after-death occurrence. This solvent

action of the gastric juice has been for the most part observed in the stomachs of very young children.

**Perforation of the Stomach.**—This condition is due to either the action of corrosive poison or disease. In the former case, when the corrosive is a strong acid, the cause is easily ascertained. Perforation, the result of previous inflammatory action, usually occurs near the lesser curvature of the stomach, less than an inch in diameter, with smooth, thickened, and hardened edges, which, with the adhesions of the adjacent parts, ought not to be difficult to demonstrate as the result of disease. However, the symptoms in these cases are so unexpected, sudden, and severe, and so closely resemble what would occur in arsenical poisoning, that it is not unfrequently presumed to be the cause of death.

Having referred briefly to the morbid appearances in death by coma, syncope, and asphyxia—by loss of blood, drowning, poisoning, etc.—it is worthy of note, that these, and other kinds of death by violence, do not, in many instances, differ scientifically from death, the result of natural causes. In any case, where these evidences may be due to conjoined action, the value of post-mortem appearances, as an indication of a remote cause, cannot clearly be defined. The evidence in all cases is either negative or positive; however, between these there are many degrees of difference, and the value of each can only be determined by scientific knowledge, assisted by chemical and microscopical examinations. With respect to the evidence of symptoms, they can only be regarded as the signs of some abnormal occurrence, which medical knowledge must interpret; they are, for the most part, secondary evidence of facts.

**Sanity and Insanity.**—Insane persons are not criminally responsible for crime. The following quotation is from the Official Manual of Military Law, Chapter VII:—

**“Insane Persons.**—A person cannot be convicted on a criminal charge in respect of an act done by him while labouring under such unsoundness of mind as made him incapable of appreciating the nature and quality of the act he was doing, or that such act was wrong. Thus if a man kills another under the insane delusion that he is breaking a jar, he will not be criminally responsible.

**“Presumption in favour of Sanity.**—Every person is, however, presumed to be sane and to be responsible for his acts until the contrary appears, and it must, therefore, be clearly established that the accused is brought within the terms of the exception as above laid down before he can have the benefit of it. Unless a person is brought strictly within the terms of the exception, it is no excuse whatever to show that his mind is affected by disease. For instance, the fact that a person is under the delusion that his nose is made of glass, will not in any way excuse him if he commits a crime, and it is shown that the delusion had no connection with the crime.

**“Causes of Insanity Immaterial.**—It is immaterial whether the unsoundness of mind is due to natural imbecility or produced by disease, or whether the disease itself is due to the sufferer’s own dissipation, as for instance, in the case of *delirium tremens*. See p. 77.

**“Temporary Intoxication.**—If, however, the unsoundness of mind is the result of mere temporary intoxication from liquor or drugs, it will be no excuse if the intoxication is voluntary, but it will be an excuse if the intoxication is produced by fraud, or otherwise against the will of the patient. Even where intoxication is voluntary, however, it will often be an important fact to take into account in considering the intention with which an act was done.” See p. 34.

The subject of insanity is of vast medico-legal importance. This disability presents itself frequently to Army M.Os., who may be called upon at any moment to form a rather hasty diagnosis as to a man’s mental state, as on foreign service or during war, under circumstances perhaps the most unfavourable to the formation of an opinion, which ought at all times to be the outcome of careful study and observation.

A M.O., as well as being called upon to testify as to the insanity of an individual, must also be prepared, at short notice it may be, to give evidence as to the sanity of an accused person, an opinion chiefly based upon the statement of witnesses before a court of law.

The plea of insanity is not unfrequently put forward as an excuse for guilt. A lunatic, unless in a lucid interval, is by most authorities regarded as incompetent as a witness. Here, again, medical evidence is called in; however, it is for the judge, or, in the case of court-martial, for the court, to examine and ascertain whether the witness is of competent understanding to give evidence.

The testamentary capacity of a person making a will is also a question involving medical evidence. By regulations a M.O. is required to declare, when present at the time a soldier is making his will, that—“the testator was at the time in a fit state of mind to execute the same.” Yet, be it observed, a will made at a time when a man is in a state of delirium from fever, sunstroke, or any such cause—“if it contains no statement inconsistent with the known wishes and desires of the party during health”—is valid. Again, a person who is but partially insane, such as a monomaniac, may make a valid will. Forms of wills for soldiers may be found in their pocket ledgers, which every man has by him at all times.

The regulations provide that—“An insane soldier, whether at home or abroad, should, as a rule, be attended by the M.O. who has been accustomed to treat him till the case has been clearly diagnosed, as such M.O., from knowing the probable origin and

cause of the attack, is considered the most competent to treat the disease in its earlier stage." There is no time specified for the man to be kept under observation or treatment until application be made for his removal to an asylum or hospital in which lunatic wards exist.

**What is Insanity?**—*Medical Definitions.*—"The terms insanity, lunacy, unsoundness of mind, mental derangement, madness, and mental alienation or aberration, have been indifferently applied to those states of disordered mind in which a person loses the power of regulating his actions and conduct according to the ordinary rules of society. In all cases of real insanity the intellect is more or less affected—hence the term *intellectual insanity*. In a medical sense this implies a deviation of the mental faculties from an assumed normal or healthy standard. In an insane person there may be no bodily disease, but his language and habits are changed,—the reasoning power which he may have enjoyed in common with others is lost or perverted, and he is no longer fitted to discharge those duties which his social position demands. Further, from perversion of reason, he may show a disposition to commit acts which may endanger his own life or the lives of those around him. It is at this period that the law interferes for his own protection and for that of society."—*Taylor*.

It is a difficult and responsible question to answer as to whether an insane person is or is not dangerous to himself or to others. Although the law is as here stated, still the principle upon which asylums are authorised recognises the necessity for a proper treatment of the insane.

On account of there being no defined standard condition of sanity—nothing absolute, definite, or fixed—insanity is difficult to define. Owing to the same cause—the want of a fixed and clearly defined standard of truth—what is falsehood is not easy to define. However, the **Legal Standard** of insanity may be taken as a mental defect, such as renders a person *unable to conform to the rules of society*. Thus the general term insanity is more a legal or social one than a medical or physiological one.

**Legal Definitions.**—"The law of England recognises two states of mental disorder or alienation: 1, *Dementia naturalis*, corresponding to idiocy; and 2, *Dementia adventitia*, or *accidentalis*, signifying general insanity as it occurs in persons who have once enjoyed reasoning power. To this state the term lunacy is also applied, from an influence formerly supposed to be exercised on the mind by the moon. *Lunacy* is a term generally applied to those disordered states of mind which are known to medical men under the names of mania, monomania, and dementia; and which are frequently, although not necessarily, accompanied with lucid intervals. The main character of insanity, in a legal view, is considered to be the existence of *delusion*, i.e., that a



person should believe something to exist which does not exist, and that he should act upon this belief.”—*Taylor*.

Moral insanity is not recognised by the law; it is manifested in a morbid perversion of natural feelings, affections, temper, habits, etc. The law only recognises insanity when protection is necessary for the safety of the public or the individual.

**Unsoundness of Mind** is a legal phrase—a condition of insanity implying incapacity for managing affairs. These words are applied to the condition of the mind itself, while *non compos mentis* is applied to the person whose mind is unsound: as this latter expression embraces the whole being affected, it is now generally adopted by legal authorities.

The Nomenclature of the Royal College of Physicians, 1885, according to which the statistical returns of sick are compiled by Army M.Os., the following division of mental diseases is made:—

**Hypochondriasis, Insanity.**—*Note.*—This term should be employed only when the case does not manifestly come under one of the following heads:—**Mania, Melancholia, Dementia**, including acquired imbecility, **Idiocy**, synonym, congenital imbecility. It may be taken that in idiocy the mental faculties have never been formed, while in imbecility other than so-called congenital imbecility there is a perversion or loss of intellectual power. This may be of traumatic origin, or succeed scarlatina, etc., and being thus acquired, the individual may be deprived of the rudiments of reason.

Although dementia and imbecility are here classed under the same head as synonymous terms, it would seem preferable if imbecility was only applied to young persons and dementia to adults, but for military statistics this is not of much importance as a distinction. Soldiers are always returned as dementia where this species of mental derangement exists. A recruit under three months' service, of defective intelligence, whose discharge is authorised on account of not “being likely to become an efficient soldier,” may labour under congenital imbecility.

**Traumatic and Epileptic Insanity** are forms occasionally met with in the service. Reference has been made to the former disability in this chapter. **Toxic Insanity**, from alcohol, gout, lead, etc., of which delirium tremens is a variety, is directed to be shown in the statistical returns under *dietetic diseases* as due to an *error of diet*, although alcohol is not a diet.

Insanity associated with obvious morbid change or changes in the brain, and *consecutive insanity* from fevers, visceral inflammations, etc., should be distinguished. Cases of *monomania* should be named according as the prevailing symptoms are those of mania, melancholia, or dementia, and any distinct hereditary tendency should be mentioned in statistical returns and the invaliding documents of soldiers.

Regarding the nomenclature of mental diseases in its medico-legal aspect, as it may tend to embarrass a witness, I quote the following from "Taylor":—

"A medical witness must not allow himself to be embarrassed by medical or legal definitions of insanity. The malady may not assume the form of lunacy or idiocy, in a strictly legal view—nor of mania, monomania, dementia, or idiocy, in a strictly medical view; but still it may be a case of *such mental disorder* as to create an *incapacity for managing affairs*. This is the point to which a medical examiner has to direct his attention. Cases of imbecility present the greatest difficulty, and create the greatest conflict of opinion among medical witnesses. Imbecility strictly implies a weak or feeble mind, and this term is properly applied to one who has an intellect below par or below the normal average. See p. 54.

"**Mania.**—In this form of insanity there is a general derangement or perversion of the mental faculties, accompanied by greater or less excitement, sometimes amounting to violent fury. Ideas flow through the mind without order or connection, the person losing all control over his thoughts, and believing and acting upon them, however absurd and inconsistent they may be. Rapidity of utterance and incessant agitation accompany this state; there is also great irritability, so that not the least contradiction can be borne. Mania may take place suddenly, as after a violent moral shock, but in general it comes on slowly. It may be chronic or acute, recurrent or continued. There are very few cases which do not present remissions, more or less complete; and in some instances after a violent attack the reason appears to be perfectly restored, forming then what is termed a lucid interval, the clear distinction of which, in a legal point of view, is of material importance."

**Monomania** is partial insanity, where delusions are generally uppermost in the mind and confined to one class of subjects. In its early stage, it is liable to be mistaken for eccentricity, but where the mind is diseased, the person's character is changed.

"**Dementia.**—This is a state which, although sometimes confounded with mania, is very different in its characters. Dementia, when confirmed, consists in a total absence of all reasoning power, and an incapacity to perceive the true relations of things; the language is incoherent, and the actions are inconsistent; the patient speaks without being conscious of the meaning of what he is saying; memory is lost, and sometimes the same word or phrase is repeated for many hours together; words are no longer connected in meaning, as they are in mania and monomania. This state is often called *fatuity*; it is a not unfrequent consequence of mania or monomania.

"Dementia varies in degree. The disordered mind of aged persons is one form of dementia; here we find memory and some mental power, although the memory is restricted to

objects long since past, and the exertions of the mind are only momentary. Some persons in dementia are quiet, others are in constant motion as if in search of something. There is generally a strong disposition manifested to collect all kinds of useless articles, which are hoarded up as if they were of great value."—*Taylor*.

The predominating symptoms of dementia may be said to be primarily a passive incoherence, that of mania an active incoherence. In the majority of instances mania occurs as an emotional disease, the intellectual derangement being secondary. The intellect includes only that part of the mind which consists in understanding and judgment.

"The following may be taken as the most striking differences between mania and dementia:—In mania there is an incoherence of ideas, but depending on too great rapidity of thought and excitement of the intellectual powers; in dementia there is a want of ideas, and the incoherence depends on the loss of the power of connecting them, owing to defect of memory; volition is lost, and the brain seems in a state of collapse. In fact, in dementia there is a more or less complete abolition of the moral, intellectual, and voluntary powers; in mania, and also in monomania, they are in a state of perversion. Dementia is often a consequence of these states, and sometimes alternates with them."—*Taylor*.

Soldiers are liable to mental affections in a proportion beyond what exists among men of their age, class, and physical development in civil life. There is a good deal of mental strain, depressing anxiety, and suppression of the emotions among soldiers, consequent on the nature of their duties, condition of service, restrictions of discipline, and the application of military law. Tropical service in our army, by reason of its liability to induce nervous or heat-exhaustion, sunstroke, and febrile affections accompanied by delirium, must be looked upon as a potent agent in the causation of cerebral derangements.

In 1878 I endeavoured to associate the origin of the excessive amount of heart disease existing as a nervous disability in the army with the suppression of the feelings or emotions consequent on the restrictions imposed by drill and discipline and the enforcement of military law, and referred to the same causes as likely to induce mental derangement.

**Delirium.**—Depending on bodily disease, toxic influences, or phrenitis, the result of exposure to a tropical sun or other causes, may so closely resemble acute mania as to be mistaken for it. The delirium is but a secondary symptom of the disease which produces it; while in mania the disordered state of the mind is the first symptom, and being dependent on a totally different cause is persistent. Delirium from bodily disease will disappear, leaving the mind clear; but mania, when apparently recovered

from, has only a remission; in this *recurrent* form it often comes on without any obvious cause, and lasts for an uncertain time. The mode of attack, severe pains in the head, excessive sensibility, and intolerance of light and sound, distinguish inflammation of the brain and its membranes.

**Feigned Insanity** has always been associated to considerable extent with the army; to deal with it within M.R. is the duty of the M.S. To feign insanity there must be a motive. In civil life no one feigns insanity merely to avoid suspicion: it is assumed after the commission of a crime. To arrive at just conclusions the medical attendant should institute an inquiry into the history of the case, for mania rarely comes on suddenly or without some obvious cause; to facilitate inquiry it should be made in accordance with the rules of evidence. It is chiefly from a M.O.'s own record of facts or acts observed or witnessed, the deeds done by the person under observation, and his manner, etc., as well as conversations, "which are not facts," that his judgment should be influenced in arriving at a conclusion; he should not be led away by vague statements, or the opinion of others, unless he knows his informant and can trust to his observation and judgment.

"The peculiar intense expression of countenance, the marked alteration of feature, and the wildness of eye of real mania, are very hard to assume and maintain. The violent excitement, the loud shouts, the strong struggles and convulsive movements of the paroxysms, also scarcely admit of imitation, and cannot be supported for any length of time. The real maniac will continue without sleep for days, and even weeks, or, if he sleep at all, his rest will be disturbed and agitated; but the impostor can scarcely keep awake beyond one or two days, and a dose of opium, which would produce no effect whatever on the madman, would infallibly send the impostor to sleep. The same remark applies to other remedies, such as emetics and purgatives. The madman will also go without food for days together with impunity and little loss of strength, and is so insensible to external impressions that he will bear the most intense heat or cold, and gaze without being dazzled on the strong light of the sun. Other symptoms of less importance have been insisted on, such as the torpid state of the bowels, the moderate or low temperature of the trunk and limbs, a peculiar odour of the skin, and a frequent pulse.

"To this account of the physical signs of mania, it may be added that the impostor will overact his part during such times as he is watched; that instead of becoming more quiet and reserved on the approach of the physician, his violence increases; that he assumes a want of intelligence, instead of that perversion of reason which is so characteristic of the real affection; that he obtrudes instead of concealing his thoughts; that he pretends a defect of memory and apprehension which does



not belong to real insanity, gives false answers to questions, and affects not to recognise persons whom he knows; that he does not recur constantly to the leading idea; that he betrays hesitation in the midst of his assumed violence; that he has not the steady gaze of the madman; that his fits occur suddenly, and at irregular and convenient intervals, instead of having the periodicity of intermittent attacks of mania. It may be added that, instead of having a period of incubation, so general in true mania, the first attack of his disorder is sudden. That perversion of the moral feelings which causes the madman to dislike every person to whom he was previously attached, being a symptom little known to the vulgar, is also not assumed by the impostor. Besides the diagnostic marks to be gleaned from the foregoing description, and the precautions already mentioned under the head of feigned diseases, some special tests have been recommended, such as repeating to the suspected person a series of ideas recently uttered, when the real maniac will introduce new ideas, but the impostor will repeat the same words. The use of the whirling chair has also been recommended, as producing giddiness and nausea in the impostor.”—*Drs. Guy and Ferrier.*

Mania is the form of insanity generally feigned, as there is a popular belief that restlessness, violent actions, incoherent language, and such-like demonstrations are the true indications of madness. The chief features of insanity are change of character, self-conceit, distrust, with or without delusions, and dislike to others without just cause.

“The feigning of *monomania* is a matter of some difficulty: it would be easily susceptible of detection. As in mania, the part would be overacted, and an impostor would thus betray himself. *Dementia* is more easily feigned; in general this state comes on slowly, and is obviously dependent on organic changes, as old age, apoplexy, paralysis, or hemiplegia; or it is a consequence of recurrent mania or monomania. As this form of insanity consists in an entire abolition of all mental power, so the discovery of any connected ideas, reasoning, or reflection, either by language, writing, or gestures, would at once show that the case was not one of real dementia. *Idiocy* and *imbecility* could hardly be feigned successfully, because these are states of congenital deficiency: they must have existed from birth, of which, of course, there would be some evidence.”—*Taylor.*

Before concluding this chapter, a few remarks will be made on the cerebral functions, chiefly of an anatomical and physiological character, and a somewhat similar course will be adopted with respect to the respiratory and digestive organs when considering the subjects of ventilation and food.

The grey matter, containing nerve cells, which forms the cortical structure of the hemispheres of the brain, is exclusively endowed with intellectual properties.

The localisation of special faculties, upon which the theory of phrenology is founded, has been frequently attempted, assisted by arguments and experiments, also by the observance of injury and disease. Although wrong actions are imputed to bad motives, still the association of good or evil thoughts or intentions with certain bumps has been but imperfectly demonstrated, and the various theories stated remain mere matters of conjecture. Of the system of association of certain parts of the brain with special endowments, Napoleon the Great, himself one of the most infamous among men, justly remarked—"They ascribe to certain prominences propensities and crimes which do not exist in nature, but are the growth of society, and are merely conventional. What would the organ of theft effect if there were no property? the organ of drunkenness if there were no spirituous liquors? or the organ of ambition if there were no society?" To this may be added Professor Huxley's aphorism that "fraud is genius misapplied."

The vesicular neurine of the brain is the only part endowed with intellectual properties. It is not the property exclusively of the cerebral cortex to generate nerve force; besides originating, conducting, and reflecting impulses, the nerve cells here are specially characterised by their capability of retaining impressions as perceptions—"conceiving;" also in reviving and re-issuing them—"re-collecting," as it is called. To recollect is the inherent special quality of the cells in the cortical structure of the hemispheres; to this power the brain owes its mental faculties—perception, memory, thought, and volition. The allotted duty of conception is to present us with an exact transcript of what we have taken in, felt, or perceived; perceptions recur as ideas. "Whatever the mind perceives in itself, or in the immediate object of perception, thought, or understanding, that I call an idea."—*Locke*. Impressions, the effects of past stimulants received at various times, are retained—stored up, as it were—in the nerve cells. This property or function is called "memory." Remembering is passive, for in so doing no mental effort is required; such thoughts occur spontaneously, without an act of volition calling forth the activity of the cells, but recollecting is called into force by an act of volition, thereby inducing a mental strain. By the association, arrangement, or separation of impressions, revived thoughts or ideas arise. One thought or many may form a conception. A notion is formed by two ideas coupled together; it is the first decisive generalized element of the thoughts. Thus the mind, in the act of thinking, associates ideas so as to form notions, which, in being expressed, become manifestations of the intellectual process. From a combination of thoughts expressed, much may be gathered as to the mental condition. Imagination is but a combination of ideas selected generally from parts of different conceptions; it has reference, probably, to things which do not exist. When



such combinations occur in disease, they are generally called fancies.

Through notions respecting things, under the guidance of judgment, opinions are formed; they are not created by the will, which is itself the product of the conditional requirements, wants, objects, ends, and aims of the individual: without some conception of things there can be no desire.

Insanity far more frequently arises from an undue indulgence of the feelings than from over exercise of the mind. Hallucinations are fancies of a mysterious character in connection with the thoughts; they generally occur in confirmed insanity, and are frequently associated with religious mania—by no means an uncommon form of insanity among our troops. An illusion refers to an erroneous imagination regarding things known to the senses; they are due to a perversion of the senses, such as taste or smell; thus ordinary food is fancied to have a poisonous, earthy, or otherwise bad taste—a frequent accompaniment of mental disease. When the sight is the seat of perverted sensations, they are said to be optical illusions. Hallucinations or illusions, when believed to be a reality, may lead to delusions of the mind.

Whenever a M.O. gives evidence respecting mental derangements, or proposes that an insane soldier be brought forward for invaliding or for removal to an asylum, it is desirable for him, in order to avoid misapprehension, to use the terms generally employed, and which have a defined meaning, in representing the mental condition of such persons. Application for the removal of an insane soldier to a lunatic asylum should be made to the D.G., the application to be accompanied by the invaliding documents. The Secretary of State authorises the transfer; in these cases he exercises a power locally invested in magistrates in dealing with civilian lunatics. A soldier confined in a civil lunatic asylum is discharged the service at the expiration of one month. In civil life, when a person is considered unable to conform to the rules of society, and dangerous to himself or others, the vexed question of depriving him of his liberty crops up; with a soldier this matter is more easily settled. I remember an officer putting it to a suspect of insanity thus: "If you are mad, I'll have to put you under restraint; if you are not mad, I'll have to put you under restraint also; so whether you are mad or not it comes to much the same thing—in one case you will be sent to prison, and in the other to a lunatic asylum."

Concerning insane sent home from abroad, *vide* **Movement of Troops by Sea.**

## CHAPTER IV.

## COMMANDING OFFICER, HIS AUTHORITY AND JURISDICTION.

THE expression commanding officer, taken in its broadest sense, means an officer in the chain of command from the highest authority downwards; when it is required to restrict the reference, the term immediate C.O. may be used. It is in this restricted sense that the expression is for the most part employed, and to it the power invested in a C.O. has reference.

**Definition of the Expression Commanding Officer.—**

The following definition is from the Q.R.:—"R.P. 128. The expression 'C.O.' as used in the secs. of the A.A., 1881, relating to '*Courts-martial*,' to the '*Execution of sentence*,' and to the '*Power of C.O.*,' and in the provisions consequent thereon, and in these rules, means in relation to any person the officer whose duty it is under the provisions of Her Majesty's Regulations, or, in the absence of any such provisions, under the custom of the service, to deal with a charge against that person of having committed an offence, that is, to dispose of it on his own authority or refer it to a superior authority."

**Temporary Command.**—"Every officer, however temporary or casual his command over a prisoner may be, will be within this definition if the custom of the service enables him to tell off the prisoner." An officer in temporary command is not to issue standing orders or alter those in existence without permission; it is not customary for him to act in any way contrary to the known wishes of the officer whose position he fills.

**Authority and Position of a Commanding Officer.—**

"A C.O. is invested with authority which renders him responsible to his Sovereign and his country for the maintenance of discipline, order, and a proper system of economy in the corps or portion of a corps under his command. His authority is paramount, whether on the parade, at mess, or in any other situation."—*Q.R.*

**Command, Medical Staff.**—It is stated in the M.R. that "The officers of the M.S. shall be the officers of and shall command the M.S.C., as well as all patients in military hospitals, and such officers, N.C.Os., and men as may be attached for duty to the M.S.C., but they shall not hold any military command outside the corps."

Here it may be seen that the *military command* with which officers of the M.S. are invested is restricted to their own corps; but their *military authority* extends over all persons in military hospitals as patients who are subject to military law, even as camp followers; and any order of a military nature given by an officer of the M.S. to a patient in hospital is a *lawful command*



quite as much as if it were given to any officer or man attached to the M.S.C. for duty. Under these conditions an offence of refusal to obey, or non-compliance with a command, or neglect to obey an order relating to a military duty given by a M.O., is punishable to the same extent as if the command or order was given by the person's own C.O. or emanated from him. This lawful authority is clearly defined, but the power to punish for any offence committed by a soldier other than one of the M.S.C. is withheld, subject to certain exceptions.

It may be seen that an officer on the sick-list, a patient in quarters, does not come within the above regulations; but he is so far under the military authority of the M.O. duly appointed to treat him, that should he wilfully disobey the orders of his medical attendant, he exposes himself to reprimand on a charge of retarding his recovery, which, if proved on active service, would at least be regarded as conduct unbecoming an officer, although not an offence under sec. 18 (3), which applies only to a soldier who delays the cure of his disease, whether in hospital or otherwise.

**Command of Detachments, Medical Staff Corps.**—It is stated in the M.R. "that the duties and responsibilities of the M.O. in command of a detachment M.S.C. are analogous to those laid down for C.Os. in the Q.R."

The position of an O.C. a detachment, especially if of field officer's rank, differs materially from, and should not be confounded with, the command of a troop or company not on detachment. By the Q.R. it is laid down that the C.O. of a detachment, if he be of the rank of a substantive major, *is vested with the full power* of awarding summary punishment accorded to a C.O. of a corps; but if he be below the rank of a field officer, and the detachment is serving in the same command as the regiment, his power may be restricted by the C.O. of his regiment or other superior authority under whom he is serving. Thus the P.M.O. of a district or command, if he should think fit, having due regard to the rank and experience of the O.C. a detachment M.S.C., may restrict him from exercising any or all the powers of a C.O.; but once a legal award is given by a C.O. of a detachment, the P.M.O. in command of the division of the corps has no authority to diminish the award by remission of the sentence or otherwise set it aside. The C.O. is not empowered to alter the record in the defaulter sheet after it has been made. Such authority is vested in the G.O.C., who can remit the punishment and order the entry of the offence to be expunged from the man's records. When a prisoner leaves the presence of his C.O. the award according to his decision is final. The case is closed and the soldier cannot be tried again on that charge or any other charge on which the same evidence would be sufficient to convict. The C.O. cannot increase although he may diminish the punishment awarded, should anything subsequently occur which would make

him desirous of so doing. The G.O.C. is the supreme authority to redress wrongs complained of by a soldier to his C.O. As previously explained, the right of a soldier in this respect is far more restricted than that of an officer; if it were not so, discipline could not be maintained.

M.Os. may not at all times command detachments of the M.S.C. It is customary, previous to embarkation, to associate together two or more small detachments for the purpose of discipline, and place them under one officer, who takes charge of the men's documents. In such cases the power of the officers commanding the several detachments to award punishments or exercise military command over their men remains in abeyance. On the other hand, it not unfrequently happens that M.Os. are handed over the documents of men embarking, when it is inconvenient or unnecessary to send another officer in charge of the party.

**Offences committed by Men attached to the Medical Staff Corps.**—The Q.R. provide for the manner in which crimes committed by regimental orderlies attached temporarily for duty to the corps are to be disposed of; thus—

“When an orderly from a regiment employed temporarily in hospital is made a prisoner for a breach of discipline, the M.O. in charge will send the man, together with a report of his crime, to be dealt with by his C.O.; but should the man's C.O. not be present, or should the man's documents have been handed over to the M.O., the latter will dispose of the case himself.”

Consequently the officer in whose charge the military documents—defaulter sheets—of a man are placed is for the time being his C.O.

“The command of a detachment of the corps will for all purposes of discipline include both the men employed in hospitals and those doing duty in the district staff of the departments.” Thus the M.O. commanding a hospital detachment at the head-quarters of a district, to which these men are attached for purposes of discipline, is responsible for their military documents and other matters relating to command.

**Position of the Principal Medical Officer.**—The following is in accordance with the regulations relative to the position of the P.M.O. as regards executive and administrative duties.

The P.M.O. of a district or command holds an appointment on the staff of the army under the G.O.C. He commands all officers of the M.S., and also the M.S.C., including the reserves and others doing duty in the hospitals, as well as being the administrative head of all establishments employed on medical services within his district: “All officers and men subject to military law thus employed in the different station hospitals or otherwise are under his disciplinary control.” Where a P.M.O. is appointed to a general hospital, he is the immediate C.O. who exercises *disciplinary power over the establishment*, and

*military authority* over all *patients* in the hospital ; but a P.M.O., as administrative officer of a district, has no direct authority conferred on him by regulations over the patients in the station hospitals within his district. This military authority to issue orders to such patients is vested in the M.Os. in charge of the hospitals.

M.Os. on the *Retired List* employed under Art. 323, R.W. relating to pay, etc., are considered officers belonging to the regular forces "and will command detachments of the M.S.C. serving under them."

Her Majesty can authorise officers of the *auxiliary forces* to exercise command over any portion of the regular forces, but for obvious reasons this is not granted in connection with hospital establishments and the charge of stores.

*Pensioners* employed as hospital subordinates are subject to military law under sec. 176 (4) of the A.A., but can exercise no command over N.C.Os. or men serving on army engagement.

For further particulars see M.R.—Duties of Officers in Command of Detachments.—This chapter does not seem to be well arranged, as matters of discipline are mixed up with those relating to interior economy, pay, clothing, etc.

Officers of the Indian Medical Service are not invested with a similar authority to command in their hospitals to that granted to the M.S., perhaps in a great measure owing to their being so frequently employed upon other than military duties. However, an *apothecary* belonging to the East Indian Service, if attached for duty in a European military hospital, is under the command of the M.O. in charge.

**Command, Rank and Military Status.**—The Sovereign is granted, under sec. 71 of the A.A., power to make regulations for command in the army, but it is stated "that command shall not be given to any person over a person superior in rank to himself." So no regulation can oblige an officer, while a patient in hospital or otherwise, to obey the command of one inferior in rank to himself, unless, as provided for in the A.A., he is engaged in a quarrel, fray, or disorder, or in case of a glaring impropriety. A M.O., whose only military rank is that of a commissioned officer, cannot command one in a position above this in the army; while, on the other hand, he is bound to obey the commands of all officers issued by them in their military capacity and within the sphere of their duties. On all essentially military executive duties the position of a M.O. is below that of a subaltern.

**Rank** is the relative position in the army which officers, warrant officers, and N.C. officers hold with respect to one another; on rank military status rests.

The different ranks in the army are thus briefly defined in R.Ws.—Pay and Non-Effective Pay—thus: "**Rank** shall, unless it be otherwise stated, be held to mean, in the case of an officer, the highest permanent rank held by him while serving, whether



substantive, brevet or honorary, and the military rank to the advantages of which a departmental officer not holding honorary rank is entitled.

**"Substantive Rank"** shall be held to include all rank except *army*, brevet, honorary, local, and temporary rank.

**"Regimental Rank"** shall be held to mean rank in a regiment or corps."

**Brevet Rank** is an army rank which carries pay with it. It remains in abeyance, as regards military command, within a regiment or corps; it does not affect regimental appointments or seniority. Commanders of companies or battalions are not superseded in their appointments by an officer of superior brevet rank. Brevet rank comes into force when an officer is detached from his regiment, or on garrison duty, or with a mixed body of troops. It is useful as a means of rewarding and advancing deserving officers.

**Relative Rank.**—The relation which exists between the ranks in the army and navy and civil services is called relative rank; but, irrespective of this rank, officers in the navy command everyone on board H.M.'s ships. Until recently, within the army certain appointments carried rank with them relatively higher than the army rank of the holder; thus the officer appointed assistant military secretary at the Horse Guards held the relative rank of colonel. This system was found to be inconvenient, especially so where officers happened to have appointments on the staff at stations where their own regiments were serving. As well as being at times inconvenient, it was manifestly a defective system, as it allowed appointments which were only held for short periods to govern rank in the army which is a permanency. When this *system* of relative rank was abolished, officers on the staff reverted to their army rank, and all officers in departments, except the medical, chaplains, and veterinary, had army rank granted to them.

The only rank a M.O. possessed was conferred on him by relative rank, which, by reason of its being connected with staff appointments, although not substantially a rank, was recognised as a rank by reason of its association with military status and position.

M.Os. rank among themselves; their military position and privileges are clearly defined in regulations. This is a matter in which there need be no misunderstanding.

The committee recently appointed to enquire into the status, etc., of Army M.Os. state: "The abolition of relative rank enabled M.Os. to say, with a certain amount of logical correctness, that they now have no rank in the army, relative rank, which they contend was the only rank they ever held, having disappeared. The R.W. of 1867 was, however, the occasion rather than the cause of the complaint of the M.Os. They admit that there never was any real substance attaching to the term



relative rank; they admit, moreover, that the restoration of relative rank would not satisfy their grievance." This committee further state—"We recommend that relative army rank, the abolition or omission of which has immediately caused discontent, should be restored," after a manner suggested by them to apply to Army M.Os. alone.

**Administration of the Law, Arrest, Investigation of Offences, and Execution of the Law by a Commanding Officer.**—The mode of administration of the law, etc., is stated in the R.P., supplemented by the Q.R. and A.Os. The principal use of the R.P. and orders in relation with them is to further the object of the A.A., so that military offenders may be brought to a more speedy and exemplary punishment than the usual forms of the law will allow.

**Military Custody** means the putting of an offender under arrest or in confinement; military custody, in the case of an officer means arrest; and in the case of a soldier, confinement under charge of a guard, piquet, patrol, or sentry.

**Arrest.**—"Arrest is of two kinds—close arrest and open arrest. When arrest is not described as open arrest, it means close arrest. An officer in close arrest is not allowed to leave his quarters or tent, except for the purpose of taking such exercise, under supervision, as the M.O. may consider necessary for the preservation of health. When in open arrest he may take exercise at stated periods within defined limits, which will usually be the precincts of the regimental barracks or camp. If the climate or the state of the prisoner's health or other circumstances require it, these limits may be enlarged at the discretion of the C.O. or other superior officer on the spot."—*Q.R.*

As a rule an officer is only kept in arrest when it is intended to try him.

A M.O. should exercise great care and judgment in his recommendations in these cases; the responsibility entailed is very serious, and a wrong interpretation may be put on an impartial opinion, so he should be particularly careful in matters of certificates and recommendations where criminal proceedings are pending. Feigning disease or malingering is not a crime that an officer can be guilty of.

An officer in open arrest is not to appear at any place of public amusement or at mess. He is always to appear in uniform without sash, or belt. An officer under arrest is deprived of his sword; he is a prisoner to all intents and purposes.

N.C.Os. are usually treated as officers with respect to open or close arrest. In the absence of a serious charge a N.C.O. need not be put under arrest.

Whenever one officer places another under arrest he should immediately report the fact.

An officer under arrest cannot demand a court-martial or refuse to be released, but, unless put under arrest by mistake, he

cannot be released without the sanction of the G.O.C. He should always be informed in writing of the nature of his offence.

A N.C.O. placed under arrest should be sent to his own room or tent, and a N.C.O. put in charge over him. If intoxicated and requiring more care than one N.C.O. can give, one or more old soldiers may be told off to assist. If living in a room or tent with privates, and he is violent or noisy, he should be sent to a N.C.O.'s room or tent, or to the guard-room.

**Drunkenness.**—In case an officer thinks that a N.C.O. or man is drunk, and desires to have him placed in military custody, the best plan is to send one or more N.C.Os. to see the person, and if he or they consider him drunk, then have him placed in arrest or confinement. In this way he will avoid coming in contact with a drunken man or appearing in evidence against him.

“A private soldier in a state of drunkenness is, if possible, to be confined alone, and in the prisoners' room or a guard-room cell, until sober, and not in the guard-room itself, where he may often be provoked to an act of violence and insubordination. Soldiers on being confined will be searched, with the object of removing knives or other weapons with which they might injure themselves. Soldiers confined for drunkenness may, when necessary, be deprived of their boots, excepting when the weather is cold, and they are likely to suffer in consequence; they are to be visited at least every two hours by a N.C.O. of the guard and an escort, in order that their condition may be ascertained. Should any symptoms of serious illness be observed, a M.O. is forthwith to be sent for. Soldiers suspected of being drunk are not to be put through any drill exercise, or otherwise tested, for the purpose of ascertaining their condition. When a soldier is charged with drunkenness, care is to be taken that he is perfectly sober before he is brought before an officer for investigation. For this purpose 24 hours should usually be allowed to elapse before the investigation.”—*Q.R.* See p. 116.

A soldier who refuses to obey an order distinctly given, or resists authority, should be confined without altercation. When a N.C.O. has occasion to confine a private, he should invariably obtain the assistance of one or more privates, and avoid coming in contact with the man himself. See sec. 9, p. 20.

“Except in cases of personal violence, or when on escort, or other detached duties, lance-corporals and acting bombardiers with less than four years' service will not confine private soldiers, but will report the offence to the orderly-sergeant, who will act as the circumstances of the case require.”—*Q.R.*

**In Billets or on the March.**—A soldier in military custody may be placed temporarily in a police station, lock-up, or other place where prisoners may legally be confined for safe custody; but for the execution of a sentence of imprisonment he should be

committed to an authorised prison, the governor of which is bound to keep him for seven days—charge one shilling a day for keep.

**The Commander of a Guard**, usually in barracks a N.C.O., cannot refuse to take over a prisoner. He will enter in the guard report, A.F., 'B' 160, the charge against the prisoner and by whom made. The officer or N.C.O. who commits anyone to custody should make at the time a verbal report of the offence, or deliver as soon as possible afterwards, and in every case within 24 hours, an account in writing of the charge against the accused, signed by himself; this is called the crime, and is stated in A.F. 'B' 252. A N.C.O. confined under charge of a guard has his offence entered in the guard report by the commander of the guard; in all other cases the entry against a N.C.O. is made in the orderly-room.

**Charges for Minor Offences**, for which soldiers are not confined, are entered in the minor offence report, A.F. 'B' 281.

"In the case of minor offences, such as absence from tattoo and other roll calls, overstaying a pass, or slight irregularities in quarters, he will not be lodged under charge of the guard, and the investigation of the charge may be held without previous confinement in military custody. A private soldier against whom a charge for a minor offence is pending will not be considered as a prisoner, but will not quit barracks until his case has been disposed of. He will attend all parades, but will not be detailed for duty."—*Q.R.*

**Exemption of Persons in Military Custody from Duty.** An accused person while under arrest or confinement is not required to perform any military duty further than such as is necessary to relieve him of the care of any cash, store accounts, or office of which he may have charge or for which he is responsible.

He should not be permitted to bear arms except by order of his C.O., and then only in case of emergency or on the line of march. On board ship he may take his turn of watch, but not guard, which is an essentially military duty under arms.

A M.O., in case of necessity, might be required to carry on his purely professional duties—affording medical attendance to sick—such as might be performed by a civil practitioner not subject to military law, and under similar circumstances a N.C.O., M.S.C., on board ship or elsewhere, might be obliged to compound medicines and make up prescriptions without having his offence condoned.

**To Condone an Offence.**—The act of putting a prisoner on a military duty should be done *intentionally, and by the person who has the power to dispose of the offence against the prisoner.* The same principle is involved with regard to exemption from punishment in case of confession of guilt. In order that a prisoner may escape from the charge against him, his confession



must be made to some person having power to relieve him wholly or partly from the consequences of that charge.

If a witness before a court-martial declines to answer a question through fear of compromising himself, should the president demand an answer, a confession made under these circumstances would be an *involuntary* confession, the president having power to award 21 days imprisonment for contempt of court.

**Investigation of Charges by Commanding Officer.**—The case of an officer charged with an offence may be investigated by a court of inquiry, but *the case of a soldier* must always be investigated by the C.O. himself, or by an officer to whom he has delegated the conduct of the investigation.

Prisoners should be disposed of daily, except on Sundays, Good Friday, and Christmas Day—when practicable in the morning before parade at the orderly-room. Minor offences charged against privates should usually be disposed of by officers commanding companies; all charges not so disposed of will be investigated by the regimental C.O. All investigation into the offence charged should be made in the presence of the accused, and he should have full liberty to cross-examine any witnesses against him, and to call any witnesses to make any statement in his defence.

**Examination of Witnesses.**—In this proceeding much will be gained by adhering to the rules of evidence.

“This duty of investigation by the C.O. requires deliberation, and the exercise of temper and judgment, in the interest alike of discipline and of justice to the prisoner.”—*Q.R.*

“After the nature of the offence charged has been made known to the prisoner, the witnesses present on the spot who depose to the facts for which he has been confined are examined. In the case of absence without leave exceeding seven days, the prisoner has a right to demand that the witnesses against him be sworn, and in all cases he will have full liberty of cross-examination.”—*Q.R.*

In cases where the C.O. has 20 or 30 prisoners to dispose of before parade, the course of proceedings is facilitated in many instances by asking the prisoner whether he is guilty or innocent of the charge of which he is accused; long explanations, counter-charges, complaints and irrelevant matter are completely excluded on these occasions.

**Decision of Commanding Officer.**—The C.O., after hearing the charge against the prisoner, may dismiss the charge, or he may dismiss it after hearing what the prisoner has to say in his defence; he may remand the case for further hearing, deal summarily with the case himself, or send it for trial by court-martial. *See p. 114.*

The award of a C.O. should be regulated with due regard to the nature of the offence before him. The character of the prisoner is no proof of guilt or innocence, and as such it is



inadmissible as evidence, but previous convictions will affect the punishment. The character of an offence may in many cases govern the character of the punishment; thus if a man is absent from ward duty, he might have the number of these duties increased.

In cases of doubt the following classification is given to assist in determining the proper amount of punishment to be awarded according to the degree of criminality; it will also be useful to bear in mind in dealing with other matters arising in the course of administration:—

(1.) Offences committed with premeditation and without provocation:

(2.) Offences committed with premeditation and with provocation:

(3.) Offences committed without premeditation and without provocation:

(4.) Offences committed without premeditation and with provocation.

As well as regarding an offence from an essentially military point of view—the one upon which the classification of military offences are founded—in addition, in awarding punishment, regard should be paid to the benign or vicious character of the disclosed offence.

**Character, how Estimated and Recorded.**—Character is estimated according to the entries in a soldier's regimental defaulter sheet. In order that uniformity should exist in estimating and recording the character of a soldier, the following terms are only to be used, viz., *Exemplary, Very Good, Good, Fair, Indifferent, Bad, Very Bad*. If a character has recently changed, "latterly" may be used as a prefix, and the statement qualified. It is a soldier's C.O. who certifies as to his character, see **Certificate**. In stating the character of a N.C.O., it must be remembered that by reason of his position he cannot have a character of a degree inferior to *good*. See p. 112.

**Rules for Guidance in Investigating Charges from the Manual M.L.**—Every offence which a person subject to military law can commit is an offence against the A.A., because it is either a military offence or a civil offence. If it is a civil offence, it is provided for by sec. 41; if it is a military offence, it is either particularly specified in the Act, or is an act to the prejudice of good order and military discipline under sec. 40. Where the act done is not a civil offence, and is not specified in the Act, the C.O. must consider whether it is or not to the prejudice of good order and military discipline, as, if not, it is not a military offence.

**To Determine as to Charges which ought not to be Proceeded with.**—The C.O., if of this opinion, on account either of the evidence being doubtful, or of the triviality of the case, or of the prisoner's good character, or of a doubt whether

the act done is to the prejudice of good order and military discipline, or, as a matter of discretion, for any reason, he must dismiss the case—A.A., sec. 46; Q.R., sec. VI., para. 36. To make an entry against the man without punishment is not dismissal of the case. The case must also be dismissed if the man has been previously acquitted or convicted of the offence by his C.O., or by any court, military or civil, A.A., secs. 46 (7), 157, 162 (6). No particular time is fixed within which a C.O. must dispose of a case, so that he can always carefully consider a difficult case; but as a rule he should decide immediately, and should never delay for more than a day, unless further evidence is required.

There is no offence which a C.O. is *compelled* by the Act or rules to send before a court-martial; but the offence of drunkenness by a private soldier must in certain cases be disposed of summarily.

As to the course to be followed, where sufficient evidence is not forthcoming at the investigation, or where a second offence is disclosed during the investigation, *see* Q.R., sec. VI., paras. 38, 39.

**No Opinion is to be Expressed while a Case is under Investigation.**—“During the investigation the officer conducting it must be careful not to let fall, before he disposes of the case, any expression of opinion as to the prisoner’s guilt, or one which might prejudice him at a subsequent trial. It frequently happens that officers who have been present at the investigation are detailed as members of the court convened in consequence of it; therefore nothing should be said or done which might, though unconsciously, bias their judgment beforehand.”—*Q.R.* See p. 114.

**Remand.**—When a court-martial is applied for or ordered, the prisoner is kept in custody, and remanded daily until the charge is disposed of.

**Summary of Evidence** is to be taken in case of remand for district or general court-martial, but is not required for a regimental court, which is essentially the court of the C.O., who can convene this court at pleasure, should he consider it desirable to have the evidence taken upon oath or for other reasons.

N.C.Os. above the rank of corporal cannot be tried by a court inferior in degree to that of a district court-martial. N.C.Os. and men M.S.C. are not tried by regimental courts-martial.

Where a C.O. decides on applying for a court-martial, the evidence given by any witnesses before him must be taken down in writing in the presence of the prisoner. The prisoner should be allowed to cross-examine within reasonable limits, and if there is any variance between the evidence as taken down and that given on the prior investigation, the prisoner must be allowed to question the witness as to such variance. Any statement made by the prisoner, which is material to his defence,

will also be added in writing, but the prisoner must be cautioned that this may be used in evidence against him.

**The Mode of taking Summary of Evidence.**—The evidence and statement, if any (called the summary of evidence), must be taken down in the presence of the C.O. himself, or of some officer deputed by him. The statements are recorded in a narrative form, but in the most essential points the exact words used by the witness or prisoner should, as nearly as possible, be taken down. The statements of witnesses should be taken according to their degree of importance—direct or indirect—and after being read over to them attested by their signature. The summary should be free from any expression of opinion.

**Power of Commanding Officer.**—The following sections of the A.A. relate to offences which can be disposed of personally by a C.O. :—

**Offences in respect of Military Services.**—*Sec. 6.* This and *secs. 8 (2) and 9 (2)*, relate to offences more severely punishable on active service than at other times. On active service a C.O. is not empowered to dispose of this class of offence.

*Sec. 8 (2).* Using threatening and insubordinate language to his superior officer.

*Sec. 9 (2).* Disobeying any lawful command given by his superior officer.

**Offences against Discipline.**—*Sec. 10.* So far as it refers to crimes such as resisting against lawful arrest or custody, or breaking out of barracks, camp, or quarters. *Sec. 11.* Neglecting to obey a garrison, regimental, detachment, or other standing order. This does not include such orders as are issued for general guidance and instructions.

**Offences against Enlistment.**—*Sec. 14.* Persuading to a commission of desertion, or assisting or conniving at desertion. *Sec. 15.* Absence from duty without leave, when the absence does not exceed 21 days; or absence from parade, school, or being out of bounds without a pass.

**Disgraceful Conduct.**—*Sec. 18 (1).* Malingers or feigns or produces disease or infirmity; also *sub-sec. 3.* "Is wilfully guilty of any misconduct, or wilfully disobeys, whether in hospital or otherwise, any orders, by means of which misconduct or disobedience he produces or aggravates disease or infirmity or delays its cure."

**Drunkenness.**—*Sec. 19.*

**Offences in Relation to Prisoners.**—*Sec. 20.* Permitting the escape of prisoners. *Sec. 21.* Irregularity connected with imprisonment. *Sec. 22.* Escaping or attempting to escape from lawful custody.

**Offences in Relation to Property.**—*Sec. 24.* Losing by neglect or making away with his arms, clothing, equipment, necessaries, etc., or wilfully injuring public, regimental, or soldiers' property.

**Offences in Relation to False Documents and Statements.**—*Sec. 27 (4).* Making a false statement in order to prolong a furlough.

**Offences in Relation to Enlistment.**—*Sec. 33.* Making a wilfully false answer to any questions set forth in the attestation paper, except cases of enlistment from the Army reserve.  
*Sec. 34.* General offences in relation to enlistment.

**Miscellaneous Military Offences.**—*Sec. 40.* Conduct, etc., to the prejudice of good order and military discipline.

A charge for any other offence than those which come under these secs., which a C.O. wishes to proceed with, must be referred to superior authority, unless delay is inexpedient, in which case he may dispose of it summarily, immediately reporting his action and his reasons for it.

A warrant officer, a N.C.O., or a camp follower subject to military law as a soldier, cannot be summarily punished.

An attempt to commit an illegal act is not an offence under the A.A., unless it is specifically stated to be one, but in civil law an attempt to commit any crime is punishable.

**Summary Punishments**, when awarded by a C.O., whenever they affect directly or indirectly the ordinary pay of a soldier, give him a right to appeal to a court-martial; the C.O. at the time of his award should acquaint the prisoner of his right in this respect. Punishments which do not so affect his pay are called *minor punishments*. It is the financial more than the physical punishment that distinguishes minor punishments as a class.

A soldier has no claim to demand a court-martial on account of loss of departmental or extra duty pay or a reference to be made to higher authority beyond the decision of his immediate C.O., which is final if within his jurisdiction, and the punishment awarded is a legal punishment.

*Right to be Tried.*—The Act does not in terms give a soldier a right of *appeal* from the award of the C.O., but gives him, in the cases mentioned in this rule, a right to be tried by C.M., instead of *submitting* to the award of his C.O. The effect is that the C.M. tries the case afresh, and awards punishment without regard to the C.O.'s proceedings. If it were an appeal, their functions would be more limited.

Sec. 138 of the A.A., which provides authority for penal deductions to be made from ordinary pay, requires careful reading.

A soldier forfeits *all* his ordinary pay, *without residue*, for every day illegally absent, or while in prison, or in hospital on account of sickness caused by an offence under this Act; but where the soldier has to make good any **sum** for loss, damage, or destruction of property, clothing, necessaries, barrack damages, etc., or the sum required to pay a fine for drunkenness, or by award of civil court, the total amount of the deductions in



order to pay the sums required for compensation or fine, or by an order of the Secretary of State for maintenance of wife or child, shall not exceed such *sum* as will leave the soldier, after paying for his messing and washing, *one penny a day*.

A C.O. may summarily award a private soldier the following punishments:—

Imprisonment, with or without hard labour, not exceeding seven days. Solitary confinement should never be imposed by a C.O. or military court: it is a punishment connected with prison discipline.

**Absence without Leave.**—In the case of absence without leave exceeding seven days, the imprisonment may be extended to the same number of days as the days of absence, not exceeding 21 days.

If the imprisonment exceed seven days, no minor punishment can be added on account of the absence, but for another offence a minor punishment in addition, or a fine in case the man returned drunk, might be awarded.

In the case of absence without leave not exceeding five days, the C.O. may deprive a soldier of pay for every day of absence; if the absence exceeds five days the C.O. will make no award, as in such cases all ordinary pay is forfeited without award.

**Forfeiture of Pay.**—R.W., Art. 824, defines when a soldier shall forfeit his pay thus—

(a.) For every day of absence on desertion or without leave above five days. When such absence is for a period not exceeding five days, the forfeiture may be either enforced or not, at the discretion of the C.O., unless the soldier has been convicted of the offence by a court-martial, in which case he shall forfeit his pay absolutely for the day or days of such absence.

(b.) For every day of imprisonment:—

(1.) Under sentence for an offence awarded by a civil court or court-martial, or by his C.O., or by the C.O. of one of Our ships;

(2.) Under detention on a charge for an offence of which he is afterwards convicted by a court-martial; or by a civil court, in case an entry is made in his defaulter's sheet to that effect;

(3.) Under detention on the charge of absence without leave, for which he is afterwards awarded imprisonment by his C.O.;

(4.) Under detention when he shall confess to have been guilty of desertion or fraudulent enlistment, and the forfeiture during the period of such detention shall have been ordered by the competent military authority.

(c.) For every day on which he is in hospital on account of sickness, certified by the proper M.O. attending on him at the hospital to have been caused by an offence under the A.A., 1881, committed by him.

To authorise this forfeiture the man must be found guilty of the offence under the Act, therefore his liability to forfeit his pay does not extend to sickness caused by intemperance or

immorality, but concealment of venereal or other disease may become an offence. If a soldier is charged with such an offence the M.O. must himself give evidence—his certificate is not sufficient.

**Stoppage of Departmental Pay for Neglect or Misconduct.**—When N.C.Os. and men of the corps are guilty of misconduct, or show themselves negligent or inefficient while in the performance of departmental duty, the M.Os. under whom they are serving may stop the whole or any portion of their departmental pay for the day on which they are guilty of such misconduct.—R.W., 674.

**Reduction of 1st and 2nd Class Orderlies.**—1st and 2nd class orderlies may, under the circumstances stated in Art. 674, be reduced to a lower class by the M.O. in command of the detachment in which they are serving, if such reduction be confirmed by the P.M.O. of the district or command; and the forfeiture of the departmental pay involved shall take effect from the day of the award.—R.W., 675.

No entries are to be made in the defaulter sheets of men who have been deprived of pay as above, or reduced on account of inefficiency; but in the case of reduction from a higher to a lower grade, an entry should be made in the man's record of service, and the same will apply in the case of reversion from lance rank. *See p. 180.*

**A Non-Commissioned Officer** reduced by sentence of C.M. is graded as a 2nd class orderly; N.C.Os. and privates awarded imprisonment by sentence of C.M. will be graded as 3rd class orderlies; privates joining from the reserve resume the grade they held on leaving the colours.

**Definition of Absence and Imprisonment.** — R.W., Art. 825. A soldier shall be regarded as absent or imprisoned under detention for one day within the meaning of Art. 824—

(a.) When he has been absent without leave or in confinement under detention for six consecutive hours, whether wholly in one day or partly in one day and partly in another.

(b.) When, owing to his absence without leave or confinement under detention, he has been prevented from fulfilling some military duty which was thereby thrown on some other person.

For fining purposes a day's absence consists of any period of six hours, but in awarding a fine it is necessary to observe a second condition, as it is provided that the number of days a man's pay is affected on account of his absence must not exceed the number of ordinary days of a week, which end at 12 o'clock midnight; thus any period of time extending over 12 p.m. will enter into the second day, and the soldier, if absent, is liable to be deprived of his pay for that day, although his absence, on the whole, may not have far exceeded 12 hours.

“For example, if a soldier is absent from 9 p.m. on Monday until 4 a.m. on Tuesday, his absence counts as a day's absence,

but no more, although the absence was partly on one day and partly on another. If, however, he had returned at 1 a.m., his absence could not count as a day's absence, unless meanwhile he was bound to go on guard or perform some other military duty, and in consequence of his absence some other soldier had to go on guard or perform that duty.

"If a soldier is absent from 6 p.m. on Monday until 6.5 a.m. on Tuesday, his absence may be reckoned as two days' absence, and it may also be so reckoned if he returns at 4 a.m. on Tuesday, and at 2 a.m. some other soldier had to go on guard instead of him.

"If a soldier is absent from 6 p.m. on Monday to any hour on Friday, the C.O. has a discretion as to enforcing the deduction of pay, because the absence has not exceeded five days; but if he returned at 2 a.m. on Saturday, the C.O. has no discretion, because the absence has exceeded five days, as the six hours on Monday reckon as one day, and the absence on Saturday, though less than six hours, still makes the absence exceed five days."—*M.L.* See p. 118.

A soldier returning from furlough ought to report himself not later than the hour of tattoo on the day his furlough expires.

**Minor Punishments.**—A C.O. may also award the following minor punishments:—

*Confinement to barracks* for any period not exceeding *twenty-eight days*, which carries with it punishment drill to the extent of fourteen days, the taking all duties in regular turn, attending parades, and being further liable to be employed on duties of fatigue, at the discretion of the C.O. Every award of confinement to barracks for *fourteen days* and under is to carry with it punishment drill (marching order).

Confinement in barracks in the case of the M.S.C. will not carry with it punishment drill if awarded to men actually at the time doing duty in hospitals; but while not so employed it will carry with it punishment drill.

*Extra guards or piquets*; these are, however, never to be ordered as a punishment except for minor offences or irregularities when on, or parading for, these duties.

**Combined Punishments.**—Any of the above punishments may be awarded severally or conjointly, subject to the following provisions:—

(1.) When imprisonment exceeding seven days is awarded for absence without leave, a minor punishment must not be given in addition to the imprisonment in respect of the offence of absence.

(2.) Any award of imprisonment, up to seven days inclusive, will be in hours, exceeding seven days in days. The imprisonment will commence as prescribed. See p. 118.

(3.) When an award includes imprisonment and a minor punishment, the latter will *take effect at the termination* of the imprisonment awarded.

(4.) A single award of punishment, including imprisonment and confinement to barracks, will not exceed twenty-eight days.

(5.) A soldier undergoing imprisonment or confinement to barracks may, for a fresh offence, be awarded further punishment of imprisonment, or a minor punishment, or both, to commence as above specified, provided that no soldier shall be imprisoned by summary award for more than seven consecutive days (except for absence without leave), and that the whole extent of consecutive punishment, including imprisonment and confinement to barracks, shall not exceed fifty-six days in the aggregate ( $28 \times 2 = 56$ ).

**Defaulters** are not to be required to undergo any portion of their punishment drill or confinement to barracks which may have lapsed by reason of their being in hospital or employed on duty.

**Punishment Drill** is not to exceed one hour at a time, and is to consist of marching in quick time only, and not of instruction drill. In very cold weather the double time may be used for short periods.

The C.O. will delegate to troop, battery, or company commanders power to punish minor offences by minor punishments up to seven days; but if an officer has less than three years' service, it is optional with the C.O. to grant him power to award three days' confinement to barracks.

**Entry of Award or Decision of Commanding Officers, how made.**—"The award of the C.O., or his decision in each case, will be entered in the guard report or minor offence report, as the case may be, and signed by him. The award of punishment by officers commanding troops and companies will be reported to the C.O. before the hour for the disposal of prisoners, and, together with any remissions or remarks which the C.O. may find it necessary to make, will be entered in the minor offence report for the day below the cases disposed of by the C.O. This report, after being signed by the C.O., will be attached to the guard report of the day. If a prisoner in the guard-room is remanded for further inquiry, his case will be brought under review daily until disposed of, and the order for remand will be entered daily in the guard report by the C.O."—*Q.R.*

The A.A. and R.P. do not require the investigation to be by the C.O., but do make him responsible for the decision. The evidence is not taken in writing, and therefore, in the case of a remand, must be taken in writing afterwards.

While investigating a charge, should the evidence disclose a different offence from the one with which the prisoner is charged, the crime should be altered in accordance with the evidence.



While taking a summary of evidence, should anything transpire which would alter the decision of the C.O., he may then dispose of the case himself.

When prisoners of the M.S.C. have been disposed of, the C.O. will transmit the crime report (A.F. 'B' 252), duly completed, to the P.M.O., who, after seeing that the punishment accorded is suitable, and that the entry of the crime and punishment has been made in accordance with regulations, will forward the report to the Q.M. charged with the payment of the men, to enable him to check the weekly issues of pay and departmental pay. The report is then sent back to the C.O. At the next inspection of the P.M.O. these crimes are compared with the entries in the regimental defaulter sheets. After the inspection of the G.O.C. they may be destroyed.

The entry made in the defaulter sheet should be the same as in the crime report. When a C.O. disposes of an offence the award is complete when the soldier leaves his presence. The proceedings of a court-martial are not complete until confirmed. It is the province of the confirming officer to regulate the award. A regimental C.M. although convened and confirmed by the C.O. when once confirmed, he cannot commute, mitigate, or remit the sentence without reference to the G.O.C. The C.O. of a division M.S.C. cannot order the crime to be so altered after an award as that one class of offence may be substituted for another, as the soldier had no opportunity of defending himself against such a charge, neither can he remit the sentence, but he can order it to be reconsidered or revised.

When sentences are apparently either too lenient or harsh, it is the duty of the C.O. of the division to inquire into the matter, but in the exercise of superior authority, in the interests of discipline, care should at all times be taken to avoid in any way weakening the authority of command. It is a principle in the service that the soldier should be taught to look to the C.O. for everything, with no by-paths to preferment. *See p. 152.*

**Reprimand, Admonition, and Reversion from Acting Appointments.**—N.C.Os., including acting N.C.Os., are not to be subjected to summary or minor punishments, but they may be reprimanded, or severely reprimanded, by the C.O. When an offence committed by a N.C.O. is of such a nature as to require admonition only, it should not be entered against him in the defaulter book, except in cases involving forfeiture of pay under R.W. (*see Q.R., sec. XXII., para. 4d.*). Acting and lance N.C.Os. may be ordered by a C.O. to revert to their permanent grade, but are not liable to a summary or minor punishment in addition. A private soldier may be admonished, but is not to be reprimanded.

Lance rank by virtue of its being paid confers no seniority over unpaid lance rank. Lance rank in the M.S.C. is not made without the sanction of the D.G. The number of paid lance

ranks in the establishment is fixed, but may under certain circumstances be exceeded.

“When lance-sergeants or lance-corporals, whether paid as such or not, are summarily ordered by their C.O. to revert to their permanent rank, immediate notification will be made of their reversion through the P.M.O. to the D.G.”

**Drunkenness.**—In the case of drunkenness a C.O. can award a fine not exceeding 10s. according to the regulation scale; the award according to the scale is compulsory. A court-martial can fine for drunkenness up to 1*l.*, either in addition to or substitution for any other punishment.

Fines for drunkenness are the only fines that a C.O. or court-martial can impose on a soldier, and in the scale of charges against his pay they are the last sum to be deducted; all other legal claims are preferent claims. While a soldier is serving fines are not to be recovered from any other source except his pay.

When deductions are made from a soldier's pay in order to make good any damage or loss of property, care should be taken that not more than is absolutely necessary to repair or replace the damage or deficiency should be stopped. The principle is that stoppages are made not for punishment, but to compensate for losses sustained.

Scale of fines, A.F. B 138, is ordered to be posted up in every barrack-room.

In computing the amount of fines for drunkenness the following rules will be observed:—

I. For the first and second instances of drunkenness during a soldier's service, no fine.

II. For the third and every subsequent instance:—

(a.) If within three months of the previous instance, 7*s.* 6*d.*;

(b.) If over three months, and within six months, 5*s.*;

(c.) If over six months, and within nine months, 2*s.* 6*d.*;

(d.) If over nine months, no fine.

III. Where a soldier is liable to a fine, and four preceding instances of drunkenness have been recorded against him within the previous twelve months, 2*s.* 6*d.* will be added to the fine laid down in Rule II.

IV. An act of absence without leave, marked with the letter D (as described in opposite page), will be reckoned as an instance of drunkenness for the purpose of computing the amount of fine for a subsequent instance of drunkenness, but a fine cannot be awarded for an instance of absence without leave.

V. The period during which a soldier is absent from his duty by reason of his imprisonment or absence without leave is not to be reckoned in the period since the last instance in computing the amount of fine.

VI. On the mobilization of the Army reserve, or when men are permitted to be re-transferred to the colours from the reserve, cases of drunkenness which have been recorded against soldiers

prior to their transfer to the reserve will not be taken into account in computing the amount of fines for further instances of that offence after they rejoin the colours.

VII. In colonial corps the fines to be levied will be one-half the amounts above specified. *See* p. 165.

**Simple Drunkenness.**—In dealing with a case of simple drunkenness unconnected with another offence, confinement to barracks should only be added to a fine if the aggravated nature of the offence seems to demand it, and imprisonment should never be awarded for an instance of drunkenness not triable by court-martial, except where the amount of unpaid fines for drunkenness recorded against a soldier is 20s. and upwards, in which case a C.O. should abstain from awarding an additional fine, and should substitute imprisonment or some other punishment.

A private soldier is “not” to be tried for a simple act of drunkenness, that is to say, drunkenness when off duty, unless four instances of drunkenness have been recorded against him in the company defaulters’ book within the 12 months preceding the date of the offence under disposal, or unless he requests to be tried instead of submitting to the award of his C.O. If the number of previous instances of drunkenness recorded against a soldier within 12 months is between four and eight, it is “optional” with the O.C. to try the case by court-martial or dispose of it summarily; if the previous instances amount to eight, the offender “should,” as a rule, be tried.

If a man has already, within the 12 months, been convicted for a simple act of drunkenness, the sending of him again for trial rests with the O.C. The 12 months will be reckoned without any deduction on account of forfeiture of service or absence from duty; but for the purpose of computing the amount of fine, the period during which a soldier is absent from duty by reason of imprisonment or absent without leave is not to be reckoned in the period since last instance of drunkenness.

The soldier is not to be credited with the enforced sobriety of a prison. Again, an entry of absence entered as equivalent to drunk, with the letter D in *red ink*, cannot be reckoned as an instance of drunkenness for the purpose of determining liability to trial, but only for the computation of a fine.

If a case of drunkenness has to be disposed of in the absence of the prisoners’ defaulter sheet, when the offence is proved, an entry should be made in the report to the effect that he is fined such a sum as is legally authorised.

In case of drunkenness, when the fine is under 7s. 6d., the entry is only made in the man’s company defaulter sheet. The entry of the offence should be made in black ink, but the number of the offence, in the column set apart for that purpose, should be entered in *red ink*.

In the case of a fine amounting to 7s. 6d. or over, or in case of conviction of drunkenness by a court-martial, an entry of the offence will also be made in the man's regimental defaulter sheet, and this entry should bear a number corresponding to the one in the company defaulter sheet.

**Drunkenness on Duty.**—In a military point of view, the offence of being “drunk on duty” is considered in reference to the soldier being fit or not fit for duty. There cannot be any distinction such as drunk, or very drunk, when on duty. Soldiers therefore are carefully inspected before being put on duty, so as to ascertain their fitness. If the superior, knowing a man to be drunk, out of good-nature allowed him to proceed with the duty, or if through carelessness he passed a man as sober when he was not sober, then it would be desirable, as a rule, to try the man for being drunk, and not for being drunk on duty.

A soldier on the line of march is on duty from the beginning to the end of the march, and if drunk in his billet or halting-place, may, if necessary, be tried for being drunk on duty.

**Drunkenness after being Warned for Duty.**—Although a soldier found to be drunk when required for any duty for which he has been duly warned can only be charged with drunkenness, and not with drunkenness on duty, yet as the Act declares the offence to be aggravated drunkenness, punishment may be awarded as if it were drunkenness on duty. On the other hand, in ordinary routine circumstances, a soldier unexpectedly called on to perform some duty for which he had not been warned—as (for example) if summoned from a canteen or from some public sports—and found to be unfit for duty, should in practice be dealt with as for simple drunkenness, although legally the offence may be one of aggravated drunkenness.

**Drunkenness—Not on Duty.**—In the offence of simple drunkenness, there are practically various grades for the purpose of the amount of punishment, and evidence should be given as to the circumstances of the drunkenness, and as to whether the drunken man was riotous or not, so that punishment may be apportioned accordingly. Nothing can justify a soldier striking or offering violence to a superior, and great care is therefore enjoined to be taken to avoid bringing drunken soldiers in contact with their superiors. Mere abusive and violent language used by a drunken man, as the mere result of being taken into custody, should not be used as a ground for framing a charge of using threatening or insubordinate language to a superior officer.”—*Chapter III. M.L. See Remarks, secs. 6 and 19, A.A., also p. 104.*

**Rules to be observed in Awarding Imprisonment.**—Any award of imprisonment up to seven days will be in hours (168 hours), beyond this in days. The mode of calculating terms of imprisonment will be found in the Q.R.

The term of imprisonment, if in days, will commence on the day of award; if in hours, at the hour the prisoner is received



into prison, always after the dinner meal. If too late for admission on the day of award, the prisoner will be admitted on the following day; if not so admitted, on account of overcrowding or any other cause, his term of imprisonment will count after 24 hours as if he were in prison.

It must be recollected that a prisoner's pay cannot be stopped for any day on which he is detained before his imprisonment begins to run under this rule. Six hours imprisonment is one day. See p. 112.

#### FORM F. A.F. C 388.

##### *Form of Commitment to Provost Prison on award of Imprisonment by Commanding Officer.*

To the officer or N.C.O. in charge of the provost prison at —

Whereas [*Name—No.—Rank*], of the — regiment, was on the — day of — 18—, awarded by his C.O. imprisonment with (without) hard labour for — for the offence of —

Now, therefore, I, the undersigned, being the C.O. of the said military prisoner, do hereby, in pursuance of the A.A., 1881, and of all other Acts and powers enabling me in this behalf, order you to receive him into your custody to undergo his sentence according to law, and for so doing this shall be your warrant.

Signed at — this — day of — 18—.

*C.D.*

Soldiers released from prison should be confined to barracks for the rest of the day and exempt from duty. A soldier receives no pay on the day he is released from prison, no matter what the hour of the day it may be, and a N.C.O., if previously in confinement, does not receive pay as such from the day of his reduction. A soldier confined awaiting trial and acquitted is charged "subsistence" allowance, but receives all his back pay. See **Provost Prisons**.

The grade of N.C.Os. and privates who are awarded imprisonment is stated at p. 112.

# TROOP, BATTERY, AND COM- SPECIMEN SHEET.—SHOWING

Place.	Date of Offence.	Rank.	Cases of Drunkenness.	Offence.	By whom Reported, and Names of Witnesses.
Reading	1883. 5 Nov.	Private	—	Absent from tattoo till 11.30 p.m. -	Sergt. C. Smith - Corpl. Wilson.
	1884. 2 Jan.	"	1	Drunk at tattoo - - -	C. Sergt. Jones - L.-Corpl. Adams.
Chatham	15 Jan.	"	2	Drunk in the canteen at 8 p.m. -	Sergt. Bold - Corpl. Ward.
"	18 Jan.	"	3	1. Drunk when a defaulter - 2. Fighting with Private F. Smith. 3. Breaking a pane of glass.	Sergt. Budd - L.-Corpl. Brett.
	3 Feb.	"	—	Disrespectful language to a N.C.O.	Corpl. Brown - L.-Corpl. Brett.
"	15 Apr.	"	—	Dirty at guard mounting - -	Sergt. Watson - L.-Corpl. Evans.
London -	3 June	"	4	Drunk on duty—when on escort -	Corpl. Hughes - Pte. Wells.
Chatham	10 June	"	—	Noisy in his cell - - -	Provost-Sergt. Potts
"	20 Sept.	"	5	Drunk in barracks at 8 p.m. -	Sergt. Watson - L.-Corpl. Brett.
"	1 Oct.	"	D	Absent from tattoo till 8 a.m. 2 Oct., when for company barrack orderly	Sergt. Hughes - Corpl. Evans.
"	4 Oct.	"	—	1. Fraudulent enlistment into Gloucester R., Bristol, 10 Oct. 2. Making away with necessaries -	Sergt. Smith, Glou- cester R. Sergt. Hughes. Corpl. Evans.
H.M. Trp. Ship Ma- labar.	1885. 4 Feb.	"	—	Smoking out of hours - -	Sergt. Watson - Corpl. Brett.
"	6 Feb.	"	—	Allowing, when a sentry on main deck, pipes to be lighted after hours.	Lt. Evans, R.M., Master-at-Arms. J. Dent.
Malta -	1886. 10 June	"	—	Late for tattoo (15 min.) - -	Cr.-Sergt. Williams - L.-Sergt. Brett.
"	1888. 15 Jan.	Corpl.	—	Overstaying his pass (4 hours) till 4 a.m.	Cr.-Sergt. Hughes - Sergt. Watson.
"	20 Jan.	"	—	Assaulting the police - -	Police-Con. Vallano " " Rizzi.
"	15 May	"	—	1. Drunk on guard - - - 2. Without reasonable excuse allow- ing a prisoner to escape.	S. M. Talbot - Pte. W. Jones. " Tomkins -
"	20 Apr.	Private	—	1. Disgraceful conduct—theft - 2. Insubordination—striking supe- rior officer, 4 Aug. 3. Insubordination—violence to superior officer, 8 Aug.	S. V. Mattei - S.-Maj. Talbot - Cr.-Sergt. Hughes. Sergt. Brett - Corpl. Hughes.

## PANY DEFAULTER BOOK.

## HOW ENTRIES ARE MADE.

Punishment awarded.	Date of Award or of Order dispensing with Trial.	By whom.	Date of Commencement.	Date of Expiration.	Remarks.
Admonished - -	1883. 6 Nov.	Col. Brown - -	—	—	H.R.
3 days C.B. - -	1884. 4 Jan.	Col. Brown - -	4/1	6/1	H.R.
7 days C.B. - -	17 Jan.	Lt.-Col. Thomas -	17/1	23/1	S.T.
Fined 7s. 6d. - - 21 days C.B., and pay for damage. 168 hrs. impt. H.L. -	24 Jan. 4 Feb.	Lt.-Col. Thomas - Lt.-Col. Williams	24/1 5/2	13/2 12/2	Forfeited 5 days pay while in hospital, S.T. E.H.
2 extra guards - -	15 Apr.	Capt. Turnbull -	—	—	S.T.
28 days impt. H.L., fined 1l.	7 June	Regtl. Ct. Ml. -	7/6	4/7	Ct. Ml. Book, Vol. , S.T.
3 days punishment diet.	12 June	Maj.-Gen. Wood -	13/6	15/6	S.T.
Fined 10s. - -	22 Sept.	Col. Thomas - -	—	—	S.T.
Deprived of 2 days pay, 14 days C.B. 34 days impt. H.L., and stoppages.	3 Oct. 20 Nov.	Lt.-Col. Williams Dist. Ct. Ml. - -	3/10 20/11	16/10 1/2/85	S.T. (10 days remitted for embarkation), Ct. Ml. Book, Vol. , S.T.
Stoppage of liquor rations (minor pun- ishment No. 4), 4 days.	1885. 5 Feb.	Col. Brown - -	5/2	8/2	G.W.
4 days confinement in a cell.	8 Feb.	Capt. Hoyle, R.M.	8/2	14/2	Warrant dated 8/2/85, Ct. Ml. Book, Vol. , J.W.
days C.B. - -	1886. 11 June	Maj. Turnbull -	—	—	S.T.
Reprimanded - -	1888. 15 Jan.	Col. Spence - -	—	—	S.T.
Fined 3l., or 3 mos. impt., H.L.	21 Jan.	Civil Power - -	—	—	Fine paid, 21/1, Regmtl. entry remitted, S.T., authority of G.O.C., 31/1/88.
Reduced to the ranks. 4 days impt., H.L.	20 May	Dist. Ct. Ml. -	20/5	30/6	42 days impt. remitted, Ct. Ml. Book, Vol. . Forfeited 1 G.C.B., S.T.
years P.S. - - Discharged, with ignominy.	12 Aug.	Gen. Ct. Ml. - -	12/8	—	Commutated to 2 years impt., H.L., Ct. Ml. Book, Vol. ., S.T.

## NOTES TO TROOP, BATTERY AND COMPANY (SPECIMEN) DEFAULTER SHEET.

*Punishment No. (4).* 18 Jan. 1884.—Five days in hospital on account of fighting. Loses pay (but without award) under the A.A. (R.W., Art. 824 (c).). See p. 111.

Whatever the punishment awarded, this offence would have constituted a regimental entry (Q.R., sec. XXII. para. 4).

(5) 3 Feb. 1884.—The imprisonment commences the day after the award. (R.P. 6 (a).)

It is unnecessary to state that the prisoner was a defaulter, as the fact does not aggravate the particular offence charged.

(9) 20 Sept. 1884.—More than three months have elapsed since date of last award, but the time passed in imprisonment does not reckon. The fine is, therefore, 7s. 6d. plus 2s. 6d. See p. 116.

(10) 1 Oct. 1884.—The absence does not amount to 12 hours; but as the prisoner was for duty, which he missed, he is liable to forfeit two days' pay. R.W., Art. 824. See p. 112.

(11) 4 Oct. 1884.—The date in col. 2 refers to the second charge; the date and place of first charge being given in col. 5. (Q.R., sec. XXII., para. 4 (f and g).)

(16) 20 Jan. 1888.—Compare Regimental Defaulter Sheet. The G.O.C. remitted the regimental entry.

(18) 20 April 1888.—The date in the second column relates to the first charge. The charge of theft was not brought until after the date of the preceding offence.

**Entries in a Regimental Defaulter Sheet** are made after the same manner. The following awards will cause entries to be made in these sheets :—

1. Conviction by court-martial or by a captain of one of H.M. ships in commission.

2. Dispensation from trial in cases of either desertion or fraudulent enlistment.

3. Conviction by civil courts, but where a fine alone is awarded the entry rests at the discretion of the G.O.C.

4. Reduction of a N.C.O. for a crime, not inefficiency, by order of the C.-in-C.

5. Imprisonment or any award affecting ordinary pay.

6. Fine for drunkenness of 7s. 6d. and upwards.

7. Confinement to barracks of eight days or over.

8. Punishment awarded to prisoners while undergoing imprisonment.

9. Conviction under sec. 6 Reserve Forces Act, 1882, of a man enrolled in the Army Reserve.

The equivalents of some of the above punishments may be found in the Summary Punishment Table, Q.R., Movement of Troops by Sea, which will also entail regimental entries. These entries always affect good conduct pay and badges. See p. 160.



### Courts-martial.

*Application for Courts-martial*—M.S.C.—“Should any matters of discipline seem to require the decision of a court-martial, the officer in command will report such cases, in the first instance, to the P.M.O., who will either deal with them himself, or, should he consider a court-martial necessary, refer them to the G.O.C.”

Soldiers of the M.S.C. are not tried by regimental court-martial, but it is not forbidden by law.

The application for a district court-martial should be made on A.F. “B.” 116; for all services the same form is used. In this form are entered the general character of the prisoner and a medical certificate of health as to fitness to undergo imprisonment, and—“that hard labour employment will neither be likely to originate nor to re-produce disease of any description;” also the name of the officer to prove the statement as to character and particulars of service of the prisoner, as recorded on A.F. “B.” 296, which accompanies the application.

With the application the following documents are enclosed :—

1. Charge sheet, in duplicate. Herein are entered description of the prisoner, the statement of offence, and particulars of the charge (*see* p. 10). In case of desertion a statement as to whether the prisoner was apprehended or surrendered is to be included. One copy of the charge sheet is intended for the president of the court, and the other is filed with the application for trial.
2. Summary of evidence (*see* p. 108). In case the prisoner is brought to trial this will be sent to the president.
3. The prisoner's company defaulter sheet. *See* p. 120.
4. List of witnesses for the prosecution and defence. Witnesses' names are entered on the back of the order for the assembly of the court, A.F., “A.” 47, which should also be enclosed in blank.
5. Statement as to character and particulars of service of the prisoner, A.F. “B.” 296. Herein the services of the prisoner towards discharge, deferred pay, pension, etc., should be entered in years and days. A schedule of convictions by court-martial is also embodied in this form, which must be a certified extract from the regimental books.

The documents 4 and 5 are to be returned to the corps with the notice of trial.

Should the C.O. of the division consider the crime not one demanding trial by court-martial, he may return the application to the immediate C.O. of the prisoner, with authority to so alter the charge as to bring it within his jurisdiction and to dispose of the case himself.

On the other hand, should the P.M.O. concur in the necessity for a trial, he will submit the application to the G.O.C., who may either convene a district court-martial or direct the P.M.O. to dispose of the charge himself, in which case the latter exercising his powers, which are analogous to those of an O.C. a regiment, might convene a regimental court-martial for the trial of the prisoner; but the usual course, under such circumstances, is to dispose of the case as above by referring it back.

There are three ordinary kinds of courts-martial—Regimental, District, General. There are two exceptional ones—field general and summary, formerly known as a drumhead court-martial. The jurisdiction, procedure, and powers of these courts differ.

**A Regimental Court** is essentially the court of the C.O. He is invested with power to convene and confirm it without warrant or further authority. This court usually assembles the day after the charge is investigated, but no longer interval should elapse than 36 hours. It is constituted of three members of not less than one year's service each. The president should be a captain if available.

**Powers of Sentence.**—Reduction to a lower grade or to the ranks of N.C.Os., fine up to 1*l.* for drunkenness, and imprisonment up to 42 days.

**District Court-martial.** — Convening officer: an officer deriving authority by warrant from H.M., or one receiving authority from one who holds such a warrant. This authority may be given to any officer not below the rank of captain. Usually the G.O.C. is both the convening and confirming officer. These courts-martial should be convened within eight days after the investigation of the offence which they are intended to try.

**Constitution of Court.**—In the United Kingdom, India, Gibraltar, Malta, five members, elsewhere three, is the minimum legal number. President: usually, but not necessarily, a field officer. Qualification of members: not less than two years' service. Disqualification: if convening officer, prosecutor or witness for prosecution, member of court of inquiry relative to the matter to be tried on having investigated the charge, C.O. of the prisoner or of his corps, or if he has a personal interest in the case.

**Powers of Sentence.**—All punishments that can be awarded by inferior courts, imprisonment with hard labour up to two years, dismissal or reduction of warrant officer to the ranks, which is equivalent to being discharged the service. In the case of a private discharged with ignominy (if imprisonment is awarded), forfeiture of deferred pay, service towards pension, and of all military decorations and rewards. The members of this court are usually drawn from different corps. When the prisoner for trial belongs to the auxiliary forces, two of the members are appointed from that force. The convening officer nominates the

president. The position of the *prosecutor* before a court-martial is that of a perfectly impartial person; he should not endeavour to gain an advantage over the prisoner on account of his superior knowledge of the law and R.P. Above a court-martial there is no court of appeal, but the judge advocate-general has powers of revision.

General courts-martial are the highest courts, with a jurisdiction and powers of sentence above all others.

The mode of proceedings of courts-martial are fully detailed in the Manual of Military Law.

The following, relative to the powers of confirming officer, are from Pratt's "Handbook of Military Law:—

**"Power of Confirming Officer.**—On receiving the proceedings, the confirming officer may confirm, partially confirm, refuse to confirm, or send back either finding or sentence, or both for revision.

"When confirming the proceedings he may mitigate, remit, commute, or delay the execution of the sentence.

"He may also vary the sentence if it be informally expressed, and may refer the finding and sentence, either wholly or partially, to a superior authority.

"In some cases of special findings on alternative charges, he will have to decide upon which charge the finding is to be held good.

"*Mitigation* of a sentence means the awarding a less amount of the same species of punishment, and has the same effect as remitting a portion of the sentence; for instance, a sentence of 42 days imprisonment may be mitigated to one of 21 days.

"*Remission* refers to the taking away of the whole or any portion of the punishment. Thus, of a sentence of 42 days imprisonment with hard labour, the whole may be remitted, or 21 days of it, or the hard labour alone may be taken away.

"*Commutation* is the changing of a punishment to one of less severity. A punishment laid down by scale can always be commuted to one lower down in the scale to which the offender might have been sentenced. Thus death may be commuted to penal servitude, or summary punishment to imprisonment.

"*Revision.*—When a confirming officer does not approve of either finding or sentence, he can order the court to re-assemble for the purpose of revision."—Revision, or the act of re-examining for correction, can only be ordered once, no matter whether the court adhere to their finding or sentence.

**Second Trials.**—According to the R.P. a trial by court-martial is not complete till the proceedings are duly confirmed. Circumstances invalidating proceedings, which occur *outside the court itself*, may render its proceedings null and void, and the accused can be brought to trial a second time for the same act; but a legally constituted court, acting within its jurisdiction, by

an illegality in its own procedure, or the improper suppression or admission of evidence, does not alter the fact that the accused has been legally tried, and therefore cannot be brought to trial again by a court-martial for the same act. A soldier who has been summarily dealt with by his C.O. is not liable to trial by court-martial for the same act, but another offence arising out of the one disposed of, and of a more serious character, may be tried by court-martial. A man may be tried a second time by a court-martial for a distinctly new offence, the result of the same act as the one for which he was previously tried, but a trial under such circumstances is illegal if "the evidence produced on the second trial have sufficed to obtain a conviction upon the first." A conviction by a military court does not exempt a person from trial for the same act by a civil court, military law being subservient to the civil law. *See Rules of Procedure.*

**Courts of Inquiry, Committees, Boards, and Courts of Request.**—A court of inquiry may be assembled by any officer in command of troops, irrespective of whether they belong to one or more corps, in order "to assist him in arriving at a correct conclusion on any subject which it may be expedient for him to be thoroughly informed." A court of inquiry may be required to give an opinion on any point not involving the conduct of any officer or soldier, neither can the proceedings of such a court be given in evidence against them, but in the event of trial by court-martial in respect of any matter or thing which has been reported on by a court of inquiry, the accused shall be entitled to a copy of the proceedings.

A charge against an officer may be referred to a court of inquiry for investigation. Whenever any inquiry affects the character of an officer or soldier, full opportunity must be afforded to the accused of being present and cross-examining any witness whose evidence he considers affects his character. A court of inquiry has no judicial power, and, strictly speaking, is not a court at all. Should the officer who assembles the court form an opinion adverse to the character of an officer or soldier, such an opinion should be communicated to the person against whom it has been given.

**Composition.**—A court of inquiry may consist of any number of officers of any branch or department of the service, according to the nature of the investigation. In ordinary cases three members will be sufficient. The senior combatant officer will act as president of courts of inquiry, committees, or boards. In case a M.O. is ranking as an officer of superior rank to the president, he should not be detailed as a member, "but should be directed to attend at the inquiry and furnish a report in writing, or to give evidence in person as a witness, if required to do so by the president."

Medical boards consist exclusively of M.Os.



**Instructions.**—The court must be guided by the written instructions of the officer by whom it is assembled. These instructions should be full and specific, and ought to state clearly the nature of the information required.

**Courts of Inquiry on Illegal Absence.**—This court is assembled when a soldier has been absent 21 days. This court will administer the same oath to witnesses as if it were a court-martial, but the members of the court will not themselves be sworn. A copy of the declaration of such a court, countersigned by the C.O., is to be entered in the regimental court-martial book, and that record, or a certified copy, will be admissible in evidence of the facts therein stated on the trial of the soldier. The original proceedings are then destroyed. The declaration has the legal effect of a conviction of desertion if the prisoner is not tried.

Deserters are not to be struck off the strength until the fact of their desertion shall have been sworn to before a regimental court of inquiry at the expiration of 21 days, as prescribed by the A.A. Until such time they are to be returned as "*absent without leave*," although they may have been reported as deserters.

**Court of Inquiry to Investigate Causes of Injury.**—In every case of a soldier, whether on or off duty, becoming maimed, mutilated, or injured, except by wounds received in action, a court of inquiry will be assembled to investigate the circumstances. The court will not give any opinion, but the soldier's C.O. will formally record his opinion on the evidence. The proceedings will be sent to the G.O.C. for confirmation, and will, after being noted in the soldier's medical history sheet, be attached to the man's record of service.

**Committees and Boards** differ only from courts of inquiry in so far that the objects for which they are assembled should not involve any point of discipline. They will follow, as far as may be convenient, the rules for courts of inquiry, but are in no way bound by them.

**All Proceedings of Courts of Inquiry, Committees, and Boards** for which special printed forms are not provided, are to be written on A.F. A 2.—Q.R.

Army Regulations, India (*Discipline*), vol. ii., p. 1139:—  
“When committees are convened by Government, composed of military and medical officers, or of these and civilians also, the relative precedence of the members is to be that in which they are named in the order convening the committee. In such cases the president may belong to any branch of the service.”

If the M.O. belongs to the military service, on account of his having no properly recognised status, he is pretty certain to be the last named; thus his position on the committee, or on a mixed board, will be that of junior member. A *Medical Board* consists of three M.Os, but in case of emergency two will be sufficient.

Commissions conduct their proceedings under the authority of a warrant.

**Courts of Request in India.**—A C.O. of any military station in India, provided he is outside the jurisdiction of a civil court, has power to convene a court of request for the recovery by civilian creditors of debts incurred by officers or persons subject to military law other than soldiers. Before convening a court the O.C. must be careful to see that the claimant is not a soldier, and that the sum claimed does not exceed 400 rupees. These courts are sworn to administer justice according to the evidence; they usually consist of five members, all of whom must have over five years' commissioned service.

**Committee of Adjustment.**—These committees are appointed under the Regimental Debts Act, 1863. Immediately any officer or soldier dies in the service, or is removed, put on half-pay, or discharged on account of insanity, a committee is appointed for the collection and disposal of his effects. A committee of adjustment is also appointed to secure the effects of a deserter, to sell effects and pay expenses. Absence without leave for 21 days for this purpose is regarded as desertion.

**On the Death of a Soldier** the committee of adjustment should, as well as collecting all Government property that was in the possession of the deceased, make out an inventory on A.F. "B." 140 of all property not belonging to the Government of which he died possessed. The will, pocket ledger, and medals accompany the non-effective documents. In the case of desertion, or when a soldier is declared by a court of inquiry to be illegally absent, the same course is adopted.

At the time a soldier is declared to be a deserter a certificate showing the amount of his unrecovered debts will be made in duplicate by the paymaster; one copy is attached to each of the men's attestations.



## CHAPTER V.

## ARMY ORGANIZATION AND ADMINISTRATION.

**Administration** in its widest sense when applied to military matters includes discipline and the administration of the law, but used in a restricted sense, as is generally the case in the army, it refers to the application of the system by which the army is raised and maintained both in men and materials.

The executive government of the army is ordered from the central office of the War Office; it relates to all essentially military duties. This office is immediately under the C.-in-C. and head-quarter staff.

The Administrative Departments are the so-called "business" departments of the War Office. Affairs which happen in the course of business are administered. To conduct these affairs and the business with which they are connected systematically and with uniformity is the object of administration.

The basis of all systems of army organization is to render the soldier formidable as a fighting machine to increase to the utmost his power of execution. The basis of all systems of hospital organization is to administer to the wants of the soldier when sick or wounded, and to restore him to the ranks as speedily as possible: both in the general and hospital organization of the army the same principle is involved. The soldier himself being the motive power and unit of strength, is the primary object to be considered in the construction of all systems of organization; the guiding principles of all formations of battle are also based upon his capabilities. Wellington used to say "that the power of the greatest armies depends upon what the individual soldier is capable of bearing and doing." In an army the soldier is the unit of physical force; resting on this, the primary organization of an army is tactical, that is to say, in the formation of units to be employed in contact with the enemy. This dictates the division of the army into certain bodies, and the system of administration must fit in with this division. In our army organization the company, troop, or battery are tactical units, while the battalion or regiment are administrative units.

A battery in its interior economy and organization approximates more towards the regiment than either a troop or company. Companies may be divided into half-companies, or brought together to form half-battalions; so with a regiment of cavalry, the troops, may be combined in order to form

squadrons to be used for tactical purposes. But these are not recognised as permanently organized bodies. The same applies to the Brigade, Division, or Army Corps.

A battalion is typical of an administrative unit: on its principles of organization our military system rests. It is also the unit upon which barracks and hospitals are constructed.

**Regimental Administration** relates to the interior economy and the conduct of affairs of a business nature carried on within the corps. Major I. W. Buxton, in his valuable work on the "Permanent System of Administration in the Army," to which I am indebted for much information connected with the subject, states:—

"An officer who thoroughly understands his regimental administration is, in one way at least, far better fitted for command than one who is at the mercy of his subordinates. Responsibility implies knowledge. The C.O. who cannot check and control his quartermaster, or the captain who leaves his company to be regulated by his colour-sergeant, confesses himself a cypher, and is on a par with the officer who, unable to handle his men on parade, leaves all in the hands of the adjutant and sergeant-major.

"It by no means follows that an officer commanding a regiment, a battery, a troop, or a company, should wish to meddle practically in every detail, or do everything himself. This is probably as great an evil as that of blindly forsaking the field in favour of subordinates. Those subordinates are given to an officer precisely because he cannot properly do the work unassisted; and if he does not avail himself of their help, it is certain that he must be neglecting his higher duties of control and supervision, and that an indulgence in an undignified fondness for trifling details, besides breeding contempt for himself, must some day lead to a breakdown, while probably his work will after all be inefficiently done.

"Certain things have to be done by officers personally; these they should do intelligently, and with a full knowledge of the why and wherefore. The more trustworthy and valuable a subordinate is, the more he will respect the superior who, having a full insight into his proceedings, and being able to correct him if needful, *nevertheless* trusts him and appreciates his zeal. He can have but a poor opinion of an officer placed over him who trusts him because he is too idle to do otherwise, who blindly signs all that is put before him, who has little or no opinion of his own, and on whom zealous work and work scamped produce the same effect.

"Other things there are which the superior should always leave to be carried out by his subordinates. But, just for this reason, there is all the more need why he should know how they are done and how they *can* be done. He *must* supervise; he may have to advise, he may have to correct; but, after having



given general directions, he should allow his subordinates to work out their tasks to a considerable extent in their own way—watching, but not interposing unnecessarily, and contenting himself with finding fault when he sees things are likely to go wrong.

“It has been said that a superior should supervise and watch the working of his subordinates; no person can supervise work of which he is himself ignorant. A foreman of working men should only intervene and handle the tools himself exceptionally, otherwise his overseeing will be badly done. But, on the other hand, who would appoint a man foreman who knew less than the working men under him of the work he had to overlook?”

“The outcome of the foregoing remarks is, that while every person in his degree has certain work to do personally, and while superiors should not have a finger in every paltry pie, no detail in administration is too mean to be *known* by the officer in the highest position.

“Under the head of ‘Regimental Administration’ we shall include here that of all organized bodies of troops, such as regiments of cavalry, battalions of infantry, batteries of artillery, and organized personnels of departments.”

The various duties connected with the great departments of the War Office are distributed among the regimental staff. The sergeant-major’s duties are strictly executive; ascending through the chain of responsibility, they keep touch with the purely executive or technical duties concentrated in the A.G.’s division of the War Office, from whence all this class of work is ordered, and the same course is pursued with respect to all duties directed under central administration. The adjutant is the regimental staff officer who, in addition to executive duties and those connected with discipline, conducts correspondence, issues or conveys regimental orders, and is, in fact, the “mouthpiece of the colonel.” The correct administration of such regimental institutions as the canteen, sergeants’ mess, recreation-room, etc., come under him. He is assisted by the subordinate regimental staff, whose work is divided each in accordance with the special duties of his office, such as sergeant-major, provost sergeant, orderly-room sergeant, canteen sergeant, etc. The Q.M.’s duties relate to those of the purely administrative departments—the Ordnance, Clothing, and A.S.C., including supply, transport, and barracks. The Q.M. is the regimental storekeeper, and transacts the business connected with his office with the commanders of companies on behalf of the Regtl. C.O., who is the responsible head over all. The paymaster is an accountant responsible to the accountant-general.

The division of labour here sketched is the model upon which all military institutions and organized bodies are constructed. It is the basis upon which the duties of all hospital establishments are founded; and this should never under any circum-

stances be lost sight of, in organizing a hospital, to make it fit in with our military system. To render any organized system effective, practical as well as technical knowledge is required in its construction. It is only through a knowledge of individual requirements you can build up and organize any system for administration. The most ingenious and elaborate hospital system, for instance, would not prove effective or fulfil its purpose if not based upon the individual requirements of the sick, harmonised with our military system. Thus the French or Prussian war hospital system will not suit us, for our hospital system must conform to the military organization of which it forms a part. For instance, in our military system no department exercises such complete control over its executive and financial affairs as the Medical Staff in France does over the medical services in their army, where it is regarded as a principle of administration that financial control is one of the essential powers of direction.

**The Staff of the Army** is composed of a permanently organized and specially trained body of officers.

General Lord Wolseley says—"Our plan of making staff and regimental officers interchangeable is admirable. When a man who has been for some years on the staff returns to his regiment for duty, he takes with him information which, to a great extent, he imparts to his brother officers almost without knowing it, whilst he learns from his association with them what no books could teach him. In this way a proper sympathy is maintained between the staff and regimental officers, and prevents the former from being regarded or from feeling themselves as a corps apart from the great bulk of the army."

The present isolation of the Medical Staff tends materially to prevent that community of feelings and interests which are essential to the harmonious working of the service.

It would be a great advantage to the service generally, and the medical service in particular, if a M.O. was attached to each regiment of cavalry brought up to its war strength, and to each battalion admitted into the 1st or 2nd Army Corps. In the event of their being required for active service, their M.O. would accompany them, or if they proceeded abroad instead, he should take his tour of foreign service with them.

Administration is required to regulate and direct the carrying out of duties within the laws by which it is governed. Administration cannot work outside or apart from organization. Where the details of a constructive organization are understood by local authorities, central administration is rendered comparatively easy.

An army M.O., in carrying out his duties in their various details during peace and war, has to deal with almost every department in the service; consequently, in the execution of his

office much tact and judgment is required by him in order to avoid friction. It is interesting and necessary to observe how departments with whom you are in connection carry on their duties. It is not alone interesting for the junior M.O. to pay attention to these matters, but it is necessary for his advancement and efficiency as a military M.O. to have a knowledge of the principles and system on which they work, and of their allotted duties and responsibilities. It may be taken as a rule that the man who is careless over a few things will never make a competent ruler over many things.

Beyond special branches of medical science—such as tropical diseases, military medicine and military surgery, which are in the strictest sense professional—a military M.O. must be acquainted with army organization and the mode of its administration. The practical application, under varying circumstances within military rules, of the laws which govern health, and also the transport of sick and wounded in war, etc., are matters which relate almost exclusively to his branch of the military art; in such matters he must be regarded as a specialist, of which knowledge can only be gained by study and experience.

The duties of the Medical Staff extend far beyond what might at first sight appear to be strictly professional—especially so from a civilian point of view. As an instance, take our army hospitals, where we now practise our profession under a liberal measure of self-government. Not unfrequently the M.O., visiting his patients in a civil hospital, has nothing to do with the directorate of the establishment. This renders his duties comparatively light, and he is relieved of many anxieties which press heavily on the army doctor. In the army, as well as being responsible for matters relating to his patients in every particular, the M.O. is responsible for the whole hospital itself, its equipment, organization, and every occurrence in connection with such services. Moreover, he is held financially responsible for all public property belonging to the hospital, no matter whether it happens to be in a building within barracks, or the equipment of a moveable hospital when campaigning.

**The War Office.**—The Secretary of State for War presides, as it were, over the War Office, connecting the working of the entire office with the Government of the country. He is assisted by the Parliamentary Under-Secretary and the Assistant Under-Secretary of State. These officers of State belong to the political party in power. The Permanent Under-Secretary transacts all routine business at the civil side of the central office.

By a recent reorganization of the War Office, all departments are placed under the C.-in-C. as a supreme head over all military administrations; still it is probable that but little change will be made as regards a re-arrangement of the duties previously conducted within the different administrations.

The "War Office list" is the only document in which the staff duties and distribution of work at the head-quarters, War Office, are laid down.

The three great departments of the War Office, which until recently divided the work between them in a position almost completely independent of each other, were the Military Department, sometimes styled the Horse Guards, the Ordnance Department and the Financial Department; these two latter, which are the great spending departments, were set apart from the other under the Secretary of State for War, but now all essentially military matters of the administrative departments are under the C.-in-C.

The Military Department principally occupies itself with executive military duties, but, in addition, the administrative work done by it extends over the following subjects: 1, recruiting and service of soldiers; 2, remount service; 3, medical service; 4, veterinary service; 5, military education; 6, military chaplain's service; 7, military law and discipline.

The Commander-in-Chief, subject to the approval of the Secretary of State for War, and to his responsibility for the administration of the Royal authority and prerogative in respect of the army, is charged with the command, discipline, distribution, military education, training, and efficiency of all persons subject to military law in the United Kingdom, including the housing, clothing and feeding of the troops, and preparing of the estimates for the above services. It is the duty of the Financial Secretary to review the annual expenditure proposed; he is also responsible for the distribution of the sums allotted under the different heads in the votes for army services, and with the auditing of all expenditure, whether pay, clothing, stores, supplies, equipment, or buildings.

The following is a definition of the duties of the heads of divisions in the Military Department of the War Office, as re-arranged under Her Majesty's Order in Council of the 21st February 1888.

1. The Adjutant-General as chief of the staff of the C.-in-C., is empowered to act in his name; he exercises general control over the Military Department; he is the channel for the communication of the C.-in-C's. orders to the army. The efficiency, distribution and technical education of the military forces are directly under him.

2. The Quartermaster-General is charged with supplying the army with food, forage, quarters, transport and remounts, with the movement of the troops, and with the distribution of their stores and equipment. He administers the A.S.C., the Pay Department, and the establishments employed on the above services, and deals with sanitary questions relating to the army. In concert with the Director of Artillery and the Inspector-



General of Fortifications, he prepares the annual estimates for the above services.

3. The Military Secretary; his duties are in relation to the appointment, promotion, retirement of officers, and the grants of honours and rewards, etc.

4. The Inspector-General of Fortifications is charged with the construction and maintenance of fortifications, barracks, and other buildings, and, as Inspector-General of the R.E., he advises as to the distribution of the corps and appointment of officers in connection with works.

5. The Director of Artillery is charged with supplying the army with warlike stores and equipment; he is controller of the Ordnance Committee, Ordnance Store Department, and the Ordnance Store Corps.

6. The Director of the Intelligence Division is charged with collecting and distributing information relating to the military geography, resources, etc., of our own or foreign countries.

7. The Director-General, Army Medical Department, is charged with the administration of the medical services, M.S.C., and medical establishments of the army, with the preparation of medical and sanitary statistical returns, with the supply of medical stores to the army, and with the preparation of estimates for the above services. He reports on the above questions through the A.G., Q.M.G., or Military Secretary, according to the nature of the matter submitted.

8. The Director-General of Military Education is charged with the education and examination of officers, N.C.Os., and men, and the administration and supervision of military colleges and army schools.

9. The Chaplain-General is charged with duties in connection with Church of England services. Arrangements as to other denominations are made by the Permanent Under Secretary of State.

10. The Principal Veterinary Surgeon is charged with the administration of the veterinary establishments and services of the army.

The Civil Departments of the War Office under the Financial Secretary are: 1. The Accountant-General, who is permanent head of the financial division, advises on all financial questions, assists in compiling the estimates, and is charged with issuing money for all army services and the audit of expenditure; 2. The Director of Contracts is charged with the supervision of all contracts for army services.

The Manufacturing Departments are under the Director of Clothing and the Director-General of Ordnance Factories.

It has been conveyed in a circular letter for general information that—"It is to be understood that every letter emanating from the Military Department of the War Office conveys the orders of His Royal Highness, after due consideration by all

branches of the War Office (including those of the Financial Department) concerned in its subject, and it does not express the decision, nor even necessarily the opinion, of the staff officer who may sign the letter."

**Army Regulations.**—The duties appertaining to each department under the War Office are laid down in special regulations. These different departmental regulations are but separate volumes of Army Regulations in connection with our military system issued under War Office authority for the guidance of all concerned. It is the duty of the legislature to order a system, that of administration and the executive to carry it out as devised.

Reference will now be made to some of these volumes of Army Regulations according to their initial numbers, and first in order we come to those relating to "Finance." It is the primary question in connection with the subject of obtaining and maintaining an army.

**Financial Instructions** in relation to army accounts are issued by authority as a guide to army paymasters on all matters connected with the receipt and disbursement of moneys.

Policy governs finance, and finance governs administration: it is practically an active agent and motive power. The potential energy of a full treasury has its equivalent of physical force just as much as a soldier's ration, which is estimated as the equivalent of sixpence.

Under the Financial Secretary is a permanent official at the War Office—the Accountant-General, who regulates all non-political questions of military finance; he is the head of the Pay Department of the army.

**Royal Warrants—Pay and Non-effective Pay.**—Army Regulations, Vol. 1. This is divided into three parts:—Part I. Pay and promotion. Part II. Non-effective pay. These two are issued as one volume. Herein are contained the R.Ws. up to 1887, that is to say, all warrants affecting the pay of officers and soldiers on the active list—not including those serving in India—only those who are paid out of the imperial revenues; pay increased or otherwise affected by promotion; and such pay as is given as a reward for services rendered, etc., or in case the recipient is non-effective.

**Allowance Regulations.**—Part III. relates to the issue of army allowances, and is separately bound—the former in red, the latter in green. The different paragraphs in R.Ws. are "Articles"; they must thus be quoted or referred to in correspondence.

The above regulations deal only with financial questions in connection with the subject to which they refer. Every allowance has its authorised money equivalent, which may be drawn by a corps, officer, or man, in lieu of any article to which they are entitled—lodging, fuel, light, rations, clothing, etc. Certain

allowances are also granted to cover expenses incurred by the service, such as travelling allowances to officers, and marching allowances to men.

We see pay and allowances are kept apart under different covers, no doubt with the view of avoiding, as much as possible, their being mixed up in accounts.

Pay and allowances, although derived from the same source, are distinct issues, and should not be confounded with one another. Moreover, income tax is charged on pay, but not on allowances, as they are given in lieu of an issue in kind, or to cover expenses incurred.

**Queen's Regulations**, Vol. II., issued in two parts. These differ from other regulations inasmuch that within them there are embodied the Orders for the Army given by supreme authority.

**Equipment Regulations**, Vol. III. **Clothing Regulations** are Vol. XI.

**The Ordnance Department** of the War Office is the whole department of which the Ordnance Store Department forms a part—purely administrative—under the Director of Artillery and Stores. This store department receives all articles turned out by the factories or purchased by contract.

The regulations for the Supply and Store-keeping Departments are contained in Vol. IV. **Army Regulations**. Vol. IV. is divided into two parts. Part I. states the duties of the A.S.C., and Part II. the Ordnance Store Department. For convenience Part II. will be first referred to here.

**Regulations for the Ordnance Store Department.**—Vol. IV. states:—This department will provide, receive, hold, issue, and account for munitions of war required for all branches of the army, the auxiliary and reserve forces, and the navy, and all military stores, except clothing and necessaries, for the army.

The Ordnance Store Department will also provide, and issue on demand from the A.S.C. as expense stores, all barrack, hospital and military prison stores, and will hold the reserve of these stores.

Further regulations relating to the duties of this department in the field and garrison are laid down in the Regulations for the Line of Communications, and the Regulations for the Supply of Stores to an Army in the Field.

In all matters connected with the supply of equipment to the army, the senior O.S.O. will perform his duties entirely under the orders of the general or other O.C. In such matters he is carrying out these details under and for the O.C., who is responsible.

There are some special stores, however, which the Ordnance Store Department does not provide—surgical instruments medicines, building materials, stationery, and clothing; but abroad

the local O.S.O. may become, as it were, the agent through which all stores are passed to the troops.

**Regulations for Army Service Corps Duties.**—Consequent on the re-organization of the Commissariat and Transport Staff, the Regulations, Part 1, Vol. IV., relating to these services have been revised and re-issued as above. Under our present system a certain number of officers of the general staff of the army are appointed to the several districts, stations, or commands for staff duties. Where more than one officer is appointed to a station, one of them will be nominated as the chief staff officer. The G.O.C. or other C.O. allots the duties of supervision and control of all army services among his staff. These services are for convenience of administration divided into two groups, A and B:—

“A, discipline, interior economy, drill, military training and instruction, musketry, signalling, camps, and schools; B, arms, ammunition, clothing, equipment, supply, transport, movement, distribution and quartering, barracks, works and fortifications, hire of buildings and land for camps, ranges, etc. In the distribution of these duties among the officers of a staff, the general or other O.C. will take care, as far as possible, to group the subjects under the letter A in the hands of one or more staff officers, and will do the same as regards those specified under B. When it can be avoided, it is not desirable to mix up the subjects of these two groups as the work of any one officer.”

The senior officer in charge of supplies and transport is the O.C. the A.S.C. in the district. Under him are supplies, transport, and barrack services. Letters addressed to him relative to any of these services should be to the Officer in Charge of Supplies, etc., A.S.C.

Officers of the Medical Staff have a great deal to do with the Store-keeping Departments both in time of peace and during war. At all times camp equipment is issued direct to corps and hospitals from the ordnance stores. In the field, barrack equipment, including hospital equipment, is also issued from them. There is no barrack department in the field or at the base of operations.

Whatever articles the A.S.C. receive from the Ordnance Store Department are kept in their “expense store”; what they procure themselves by contract are kept in their “supply store.” “Stores” are distinguished from “supplies,” the latter name being given to such consumable articles as food, forage, fuel, lighting, etc.

The transport for sick and wounded is supplied by the A.S.C., unless it happens to be naval or railway transport. Food supplies of all kinds, including medical comforts, are obtained, conveyed, and issued by this corps.



The expression *medical comforts* tends to mislead, and is frequently misunderstood by general officers, staff officers, and others, who wrongly consider the Medical Department in the field responsible for them. Medical comforts are, in reality, commissariat comforts for the sick; but as a blanket, or any such thing, may prove as great a comfort to a sick soldier as a dietetic comfort, I would suggest that the name *diet extras*, which states exactly what they are, should be substituted for medical comforts.

"Transport is intimately connected with the Medical Department of an army, for the removal of the wounded from the battle-field, the necessary dispersion of the sick, and the provision of medicaments and appliances, on which rest the saving of human lives, depend on transport entirely. It will be urged against a separate transport that the medical pressure for transport is occasional, whereas with supplies it is constant; hence endowing the Medical Department with a special transport must be detrimental to the economical working of the general transport of an army, yet the importance of a separate transport for this department cannot be underrated. The description of transport needed is special, and, as the time for sick convoys to move depends on certain considerations which only medical officers can estimate correctly, it is difficult to foretell when a pressure may arise; who is to guarantee, when the necessity appears, that the commissariat officers, who are interested parties in the transport, may not consider the needs of their own service far to outweigh those of the Medical Department, thus giving rise to a difficulty which could not occur were a distinct transport affected to this department."—*Col. Furse.*

**Regulations of the Royal Engineer Department—**  
Vol. V.—The professional duties of officers of R.E. include preparation of all plans and designs, as well as superintendence and execution of all military works, the conservation of fortifications, military buildings, and War Office lands, the superintendence of the working of telegraphs, making of surveys, etc.

The responsibility of the department in each district is vested in the C.R.E. of the district. He is the channel of communication on all questions concerning the R.E. Dep. to the G.O.C.

The C.R.E. will receive instructions from the C.-in-C., through the D.A.G., R.E., on all points connected with the military duties of the corps, but on departmental subjects their instructions will be communicated to them by the Inspector-General of Fortifications.

Officers, although employed on departmental duties, are liable to all military and garrison duties.

The R.E. Dep. make contracts for the execution of works, which remain in their charge until complete. In the case of bar-

racks, when fit for occupation, they are handed over to the A.S.C., and then to the troops.

The province of this department consists in directing the engineering operations of an army, more than in executing these operations.

All the comforts and conveniences in every respect, as healthy habitations, in connection with their construction, fixings, and general suitability, the laying-on of water and gas, system of ventilation, sanitary contrivances, the position and construction of baths, urinals, and closets, and the carrying off by means of permanent ways sewage and drainage, are under the control and direction of the R.E. Dep. Thus the duties and consequent responsibilities of this department are intimately associated with the health of the troops.

Under the Inspector-General of Fortifications are two deputy inspectors—one for fortifications, and the other for barracks.

The engineer annual estimate for works form a portion of the basis upon which the army estimates are completed. They are included in one vote, "Works and buildings:"—

1. Fortifications and ordnance store buildings.
2. Barracks and hospitals.
3. Manufacturing establishments.

With a view to the preparation of No. 2—which is the only one with which we are concerned—the C.R.E. of the district will compile, from information obtained from various C.Os. and heads of departments, a return of the various services he proposes should be provided for in the estimates. Each estimate shows proposed new works, additions, alterations, improvements, and current repairs. The first estimate sent in annually by R.E. Dep. is the approximate estimate. This should be at the War Office by 1st September from home stations. When the estimate for barracks is returned, showing what services are sanctioned, and when finally approved of by the G.O., the "detailed estimate" is made out, and due at the War Office by 20th October from home stations, and 1st of November in each year from abroad.

In these estimates the C.R.E. will make provisions for sanitary measures such as he may deem advisable to remedy—defects in ventilation, drainage, or other arrangements tending to affect health; also sums necessary for the due maintenance of works, periodical painting, lime-washing of barracks, and sums to cover the probable outlay in making good barrack damages, the amounts received from the troops being paid into the Exchequer.

**Regulations for the Medical Department.**—Army Regulations, Vol. VI. Divided into Parts I. and II., Medical Services. Part II. relates to the duties of the M.S.C.

The duties and responsibilities of this department are so manifold and comprehensive, as to render it impossible to define them in regulations in a manner similar to what is done in the regulations relative to the special duties of other departments. Consequently, the regulations for the A.M.D. are framed on a specification of the duties of the Medical Staff and M.S.C. in the various appointments held by them.

The Medical Department is maintained in order to retain the soldier in health, which is his recognised normal condition of physical fitness for duty. When disabled, through disease or injury, from performing his duty, the soldier is an incumbrance to his battalion, which should be relieved of him under the direction of the Medical Staff, whose special province it is to restore the man to health and return him to the ranks as speedily as possible.

**Organization of the Medical Staff.**—The Director-General is the responsible head of the Medical Department. The department comprises the Medical Staff, Medical Staff Corps, and the reserves, the African Medical Service, the Militia Medical Staff, and the Volunteer Medical Service. Although the East India Medical Service is no part of the Medical Department, the military sections of it are in a great measure subject to the administrative control of the Surgeons-General of the M.S., appointed as P.M.Os. to the different Presidencies.

The officers of the Medical Staff are divided into *administrative* officers—surgeons-general and deputy surgeons-general, and *executive* officers—brigade surgeons, surgeons-major, surgeons, quartermasters. This division, as a rank, is more easily distinguished than their duties can be defined, as both executive and administrative duties are associated more or less, in the majority of appointments, in either of these divisions of the department.

**The Establishment** of the Medical Staff is: surgeons-general, 9; deputy surgeons-general, 25; brigade-surgeons, 50; surgeons-major and surgeons, 750.

**Distribution**, at home stations: surgeons-general, 4; deputy surgeons-general, 10; executive officers, 352.

*On Foreign Service*, otherwise than in India: surgeons-general, 2; deputy surgeons-general, 5; executive officers, 126.

*In India*: surgeons-general, 3; deputy surgeons-general, 10; executive officers, 322.

There are 79 retired officers of the M.S. employed at home stations.

Subject to the G.O.C., administrative M.Os. appointed to districts or commands, or with troops in the field, are on the staff of the army. General Hospitals are placed under the direct control of administrative M.Os. An administrative officer holding an appointment is called the Principal Medical Officer when referred to or addressed in connection with it. An executive

officer, the senior at a station in charge of troops, or when acting as P.M.O., is called the Senior Medical Officer.

The P.M.O. of a division holds an appointment on the staff. He is administrative officer for all medical services within his district, which extends over the military division. He also commands the Medical Staff and M.S.C. in his district. No other administrative or staff officer is in the same position as commanding officer and responsible for the carrying out of executive duties. This organization is defective, insomuch as during war it may throw on one person an excessive strain. Moreover, it is scarcely in harmony with the general organization of the army as at present arranged, and into which the medical services must finally be admitted, probably organized on the same lines as the Army Service Corps.

**Organization of the Medical Staff Corps.**—The Medical Staff are the officers of the M.S.C. organized on the same lines as the late Commissariat and Transport Staff, who were the officers of the Commissariat and Transport Staff Corps.

In the United Kingdom, for purposes of local command and administration, this corps is organized in divisions. A division is comprised within each district held by a P.M.O. These districts and divisions extend over the command of a general officer. The P.M.O. commands the M.S. and M.S.C., including the reserves of the corps within his district; beyond this administrative unit there is no sub-division of the corps into permanently organized bodies. A bearer company is a transient body, called into existence with the brigade or division to which it belongs on active service.

**The Position of the Principal Medical Officer as Commanding Officer** of the Medical Staff and Corps within his district resembles that of an O.C. a regiment, who has many of the men of his regiment "on detachment" in the district or command in which the head-quarters of the regiment is stationed. The men of the M.S.C. serving in the station hospitals within the district are "on detachment," under the immediate command of the officers in charge of the hospitals, but the administrative duties connected with command, relative to pay, clothing, equipment, etc., of the detachment, rest with the P.M.O. as C.O.

**The District Quartermaster's Duties** at the head-quarters of a division of the M.S.C. are the same as those of a Q.M. of a regiment, and are in like manner conducted on behalf of, and under the orders of, his C.O., but in addition, as paymaster of the division, he is a sub-accountant to the district paymaster of the military district. The district Q.M.'s departmental or general duties outside the corps are also conducted under the orders of the P.M.O., who is the administrative head over all medical arrangements within his district.



**Divisions.**—The following are the stations of the headquarters of divisions of the M.S.C.:—

1st Division	-	-	Aldershot	10th Division	-	-	Edinburgh
2nd	"	-	Netley	11th	"	-	Dublin
3rd	"	-	Portsmouth	12th	"	-	Belfast
4th	"	-	Devonport	13th	"	-	Cork
5th	"	-	York	14th	"	-	Curragh
6th	"	-	Colchester	15th	"	-	London
7th	"	-	Chatham	16th (Depot and Training School)	-	-	Aldershot
8th	"	-	Dover	17th Division	-	-	Chester.
9th	"	-	Woolwich				

All men on foreign service are regarded as on detachment.

**Establishment Medical Staff Corps.**—The following is the establishment of the corps according to the numbers estimated for in 1889–90:—

Sergeant-Majors (Warrant Officers)	30	
Staff-Sergeants, 1st class	40	} Sergeants, 332
Staff-Sergeants, 2nd class	80	
Sergeants	212	
Buglers	12	
Corporals	280	} Rank and file, 2,026
Privates	1,746	
Total all ranks	2,400	

The proportion of 1st, 2nd, and 3rd class orderlies in the establishment of the corps are 38 in both the 1st and 2nd class, and 24 in the 3rd class.

The M.S.C. does not serve in the East India command, or in the West Indies, as men from West India regiments are now appointed for duty at the different hospitals in the latter command, after a manner proposed by me in 1880.

**Distribution Medical Staff Corps.**—The following is the distribution of the corps:—

	Home.	Colonies & Egypt.
Warrant Officers	17	13
Sergeants	269	63
Buglers, etc.	12	—
Rank and file	1,665	361
Total all ranks	1,963	437

The entire training of the M.S.C. rests with the M.S. officers, who are responsible for its efficiency as a corps.

**Duties of the Medical Staff.**—These are intimately connected with the soldier from start to finish of his career. The M.S. never lose touch with the rank and file of the army, whether at home or abroad, during peace or war; while in case of death, the further duty devolves on them of discovering by

scientific examination its immediate or remote cause, and finally to advise as to the interment or disposal of all human remains.

The treatment, nursing, care, and comfort of the sick and wounded soldier are entrusted to the Medical Department, and with respect to these, its special duties, it is as independent as any other military department limited only in accordance with the general working of our military system, and such contingencies as may arise through the exigencies of the service.

The efficient performance of those duties is essentially the trust reposed in an army M.O. by Her Majesty's commission. This entails great responsibility; it may be, at times, involving the immediate care of not less than one-fourth of an entire force. During the Nile campaign, it is stated that out of a total of 10,771 officers and men, no less than 8,593 passed through the hospitals. These more than helpless sick and suffering are at all times and under all circumstances the chief incumbrances of an army, yet M.Os. must be mindful to avoid inordinate demands on their behalf, or extravagances in fulfilling such obligations as are connected with their position and trust.

One peculiarity of the Medical Department, among departments of the army, is, that it is the only one capable of performing the duties for which it is maintained without employing external or civil aid; other departments work by contract.

Independent of a knowledge of what is termed curative medicine and operative surgery, a sanitary officer, if the expression may still be used, should be one skilled in scientific and preventative medicine. Such an officer should be acquainted with the organization of the troops with which he is serving, and have a practical acquaintance with the interior economy of corps; this information will increase his usefulness, and have the effect of enhancing the value of his opinions with those in military authority.

As well as to restore health and cure disease, the executive and purely professional duties of the M.S. are to examine recruits on enlistment, to ascertain the physical fitness of a soldier to undertake foreign or war service, to re-engage or prolong his service, and, when considered disqualified as physically unfit for further service, to examine, recommend, and advise as to his discharge; also to examine men as to their fitness to undergo imprisonment or other punishment, to vaccinate, and make health and sanitary inspections.

For the correct performance of these duties a knowledge of regulations is necessary, as well as an acquaintance with the special requirements of the service. Such duties may fairly be distinguished from professional advice on matters of hygiene or opinions given in connection with secondary evidence on medical subjects. Administrative M.Os. are not unfrequently called upon to form opinions, give decisions, or draw up reports, based not on a personal observation of facts, but on their medical and

scientific knowledge and experiences. To deal with statistics, documentary evidences, and with matters of a general nature, or those brought collectively within the knowledge of a superior, are for the most part administrative duties.

Although most of the duties of the Medical Department laid down by regulations are executive, still, strictly speaking, it is not a purely executive department; its duties extend to limits not easily defined. Those duties, carrying responsibilities with them, exercise their influences not alone through the service, but extend beyond it to the civil population by which the army is surrounded, in many instances assisting in the accomplishment of political events, as well as in other respects contributing to military success, which is the ultimate object for which this department is maintained.

The standard by which the services of all persons within the army is gauged is a purely military one.

It is a sound principle in our service that it is only in connection with the success of military operations, to which M.Os. like others contribute, that they can hope for any distinction or reward. This is perfectly independent of scientific civil attainments or medical knowledge of a general character outside military affairs, proficiency in which is beyond official recognition. This principle is well exemplified in the Chaplain's Department, where, apart from creed or theological knowledge, all exceptional advancement of its officers occur in connection with field service. The most noble actions and self-sacrifice to duty must go unrewarded should disgrace or disaster befall the army of which you form part; neither is there any statute of limitation as to what a M.O. may be called upon to do on service in order to contribute toward the furtherance of the common purpose. Recently, in Egypt, they had command of boats' crews, convoys, etc.; here also the transport of much treasure was entrusted to the Medical Staff.

**Responsibility in connection with the Health of the Army.**—The preservation of the health of the troops and the responsibilities connected therewith is rather of a mixed character; it is by no means a duty centred in the Medical Department of the army; it is a matter frequently in the hands of other departments, and most of all under the control of C.Os. Officers of the M.S., with respect to the preservation of health, exercise their influences as a suggestive body—initiative rather than executive—and herein their chief responsibility lies; the executive or military motive power is elsewhere concentrated. They cannot justly be held responsible for the amount of sickness in the army, the waste going on in the ranks, or the remarkable quickness with which soldiers become aged and worn out. The conditions of the service undoubtedly remove from the soldier much of that control over his own health of which the civilian remains possessed, and thus the responsibility



of preserving his health rests, if not primarily yet in a great measure, with the State. This obligation falls mainly on his immediate C.O., who is as responsible for the health of his men as he is that they enjoy those accessories to health—good and sufficient food, properly cooked and served, liquor only in moderation, clothing suitable to their employments and state of the weather, a fair proportion of nights in bed, sufficient barrack accommodation, and a due observance of all hygienic and conservancy arrangements. Officers are not enough impressed with the magnitude of this trust and responsibility in connection with military command. Things which add to the social and material comforts of the soldier, tend towards a condition of happiness and contentment, which induce a state of health and vigour recognised as the chief attribute of an army. During peace a stock of health should be laid in and stored up, in order that the body may be retained in as normal a state as possible under the strain of war.

The healthy condition of a regiment is the best index of its fitness; crime and drunkenness may be suppressed, but without health, and consequent endurance, there can be no efficiency. Loss of health may be owing to an excess of system almost quite as much as on account of a want of discipline. Although the system under which our soldiers live may not of itself deprive hygienic conditions of their invigorating tendency, still the means adopted for the enforcement of discipline are not unfrequently at fault, and so tend to counteract its beneficial influences; however, discipline and health under our present enlightened dispensation are steadily improving, and the more public opinion becomes educated by scientific knowledge, so accordingly will our military system progress, and more health and stamina will be secured to the army.

It is not easy to say to what extent responsibility in connection with the want of health among troops should be participated in by the Medical Department. With respect to a certain class of disease the R.E.Dep., as it were, hold the key of the position. Not unfrequently diseases in garrison towns arise through engineering defects, chiefly connected with underground drains, water supply contamination, or imperfect ventilation. These diseases are for the most part of a dangerous nature, sometimes occurring as outbreaks and creating alarm for the time being; yet there is an impression abroad that the Medical Staff are responsible for all hygienic conditions.

Again, as regards the dietetic class of disease, there may be a divided responsibility. The supply of food, its quantity, quality, variety, preparation, and the hours at which it is taken, with respect to physical exertion, are matters connected with the supply department, military administration, routine and supervision, which also embrace the means taken for the suppression of drunkenness. The health and physical comfort of men in



regiments, especially on field service, are greatly dependent on the energy and action of their Q.M., who, at the same time, is likely to take his tone from the C.O.

Then there are tropical diseases, to which our soldiers are specially liable, consequent on their conditions of service. Furthermore, there is a remarkable prevalence of diseases of the circulatory system, attributable to some defects in our military system, the training of recruits, and the effects of drill, discipline, and the execution of military law. At one time the Factory at "Pimlico" was supposed to manufacture this class of affection—an exploded idea, although it had some share in its production.

**Vaccination and Small-pox.**—Vaccination, as a means of prevention of disease, is placed entirely in the hands of the Medical Staff; and so efficiently is it carried out that there need be no apprehension of a serious outbreak of small-pox occurring among our troops. A soldier in his statement on enlistment expresses his willingness to be vaccinated or re-vaccinated. I may mention that in the French army re-vaccination is not practised. With what result?

During the Franco-Prussian war, which took place in the epidemic years of 1870–72, the deaths from small-pox in the French army was over 23,000. The well-vaccinated German army, which followed in their track, and took charge of a great number of their sick, lost only 271 men from small-pox. Not a single death from small-pox is said to have occurred among the Prussian troops since 1874, subsequent to the establishment of compulsory re-vaccination at the age of 12 years in Germany, while, on the other hand, the neighbouring armies of Austria and France still suffer considerable losses from this disease.—*Morache*.

In Egypt, where our soldiers are surrounded by a very imperfectly protected community, in 1885, 25 cases of small-pox and four deaths occurred; in the year following, 51 cases and three deaths.

Considering the modifying and subduing influence vaccination exercises on small-pox, it would be unreasonable to suppose that a French army could have been anything like as successful in the treatment of the disease as we were, as shown above, which represents one death in 15 admissions. The deaths from small-pox among unprotected persons is one in three of those attacked by the disease.

General Lord Wolseley, in his advice to officers ordered on service, says—"If they have not been vaccinated they should be so at once."

**Venereal Affections.**—The military authorities are no longer responsible for the spread of venereal disease among soldiers by the civil population; but they are more than under an obligation to see that the civil population does not suffer in this respect by contact with the military. Even apart from

military considerations, it behoves M.Os. to exercise their influences to mitigate or prevent, by every means in their power, the spread of this most destructive malady.

The Chaplain's Department, by employing its moral force within its own special sphere of action, should materially assist in the repression of drunkenness and immorality—the besetting sins still predominating in the army.

**Army Forms.**—The following is the regulation classification of A.Fs. according to the initial letter, added for easy reference, and to direct attention to the system adopted in arranging the forms used in the service.

**Division I.**—Forms relating to personal matters, not being vouchers.

*Class* “A,” General; “B,” Regiments and Corps; “C,” Staff and Departments; “D,” Reserves and Pensioners; “E,” Auxiliary Forces.

**Division II.**—Forms relating to supplies, not being finance vouchers.

*Class* “F,” Commissariat Supplies; “G,” Ordnance Store Supplies; “H,” Clothing and Necessaries, etc.; “I,” Medical Supplies; “K,” Lands, Works and Buildings; “L,” Stationery, Forms and Books.

**Division III.**—Forms relating to finance.

*Class* “M,” Estimates (not being vouchers); “N,” Accounts and Pay Lists (not being vouchers); “O,” Personal Vouchers; “P,” Supply Vouchers.

Army Books are numbered, but have no initial letter.

**Vouchers.**—A voucher may be a book, paper, or document of any description which serves to vouch the truth of accounts, which are generally given in detail. In order to fulfil its purpose, or to confirm and establish facts of any kind, all transactions which take place within the army of a mercantile, commercial, or, say, business character, are verified by vouchers on special War Office forms, except, it may be, a certificate voucher in connection with equipment brought on charge, for which no receipt has been given; this is merely a manuscript certificate of articles brought on charge.

There are many kinds of vouchers used in the service. That most frequently required is the Receipt Voucher, accompanied by a Delivery Voucher, employed where stores or equipment are issued by a storekeeper. The officer who issues, or the officer who returns stores, is responsible for the preparation of these receipt and delivery vouchers; apart from vouchers the responsibility is of wide acceptance in the service. The outgoing officer, in handing over his charge, is always responsible for the preparation of the transfer documents.

It is essentially necessary, for the proper keeping of stores and rendering of ledger accounts, that the officer who takes over stores should be supplied with a delivery voucher, signed by the

officer from whom he receives them at the time of signing the receipt voucher; these vouchers should be fac-similes.

The form used in these transactions—"Equipment in General"—is A.F. G. 1,033. Forms with different numbers are required in connection with arms, harness, engineer, and artillery stores, etc., but the above is the form used generally in connection with the equipment of a field hospital on service when special forms cannot be obtained. In regiments where there are workshops, and articles are converted into others, Conversion Vouchers are used in support of the transactions.

An Expense Voucher is one by which articles that have been damaged or lost are struck off charge. The same A.F. P. 1,925 is used, although the entry is on separate forms, whether the public bears the cost, or whether it is chargeable to the troops. Articles cannot be struck off as chargeable to the public without due authority from the general or other officer commanding the troops. Whenever a board is necessary to recommend that articles be struck off charge, it should be a garrison board. All articles of equipment received are entered on the left-hand page of the folio in the ledger, the issues are entered on the right-hand page; each left and right hand page of the folio or opening between the leaves bears the same number. Articles should be entered in the order in which they appear on the voucher. Each voucher is numbered at the top by the person who issues the stores; it is very necessary to enter this number in the column for the purpose in the ledger. On the delivery voucher, which is the voucher for articles received, it is also necessary that the ledger folio in which the articles are brought on charge should be entered; the same applies to the receipt voucher, which is the voucher for articles issued. By thus doing, the auditing of accounts will be facilitated, and the ledger account passed without giving trouble and anxiety, or probably causing you to be put to expense within a year or so, after a campaign. *See p. 39.*

The Equipment Ledger for field hospitals is Army Book 248.

In War Office Memorandum, dated May 1888, attention was directed to the regulations relative to the accounting for stores, which will probably be published in the next issue of the Ordnance Store Regulations. The above memorandum refers to an amplification of the instructions contained in existing regulations.

M.Os. must bear in mind that they are to requisition for what equipment they require, unless specially informed by a responsible superior that this has been done.

The special form of requisition is A.F. "G" 1015, and the special Receipt and Delivery Voucher is A.F. "G" 1016. Where a Q.M. is serving with a M.O., he is responsible for the preparation of all requisitions and returns, except purely professional ones.



Before signing a voucher, see that the blank spaces are obliterated by drawing a line diagonally through them. See sec. 26, A.A.

**Correspondence.**—*Letters, how to be Written.*—Official letters are to contain full information of all particulars upon the subject to which they relate, and are to be headed thus:—

*From* — [Here state rank, name, and corps].

*To* — [Here state officer or head of department addressed.]

Each letter is to refer to one subject only, and is to be written on foolscap paper with quarter margin. The paragraphs are to be numbered, and the enclosures (if any) described in the margin or in a separate schedule. As a general rule, short communications may be written on a half-sheet; but when the letter extends beyond one page, or is accompanied by enclosures, it should be written on a whole sheet. The transmission of unnecessary enclosures is to be avoided, and when additional papers are forwarded, all blank fly-leaves are to be removed from them.—*Q.R.*

The subject matter is indicated at the left-hand top corner of the letter; for example—Discipline, Equipment, etc.

The number of enclosures in a letter are sometimes entered on a line drawn diagonally across the free margin of the paper.

When a communication has reference to previous correspondence from a higher office, the registered number, date, and purport of the former papers should be quoted.

In original communications words should not be underlined, as if in italics; neither should abbreviations be used in stating the title of an officer.

The ordinary official memorandum form is printed so as to be written on half margin. Communications to the Financial Department are directed to be written on half margin.

**Minutes, how to be Written.**—All replies, remarks, or queries arising out of an original letter or memorandum are to be made in the form of minutes. The first minute is to follow on the page where the original letter or memorandum ends, and each succeeding minute is to immediately follow that which, by date, precedes it. Each minute is to be numbered (in red ink). The original letter is marked 1; the first minute 2, and so on. A fresh half-sheet is to be added, when required, for the commencement or continuation of a minute, and on no account is such commencement or continuation to be made on vacant spaces under previous minutes, or in the margin.—*Q.R.*

**A Minute Paper** is a cover for letters and other documents received at the War Office. On it are noted the registered number of the contents, the date of arrival, and the department to which it is to be sent. On this paper minutes are written concerning the subject matter enclosed.

**Local Adjustment of Questions by the General Officer Commanding.**—Superior officers and other intermediate authorities are responsible for the correctness of what is set forth in



documents submitted by them, but it is their duty to endeavour to adjust all matters that come within the scope of their authority. In transmitting applications or correspondence to head-quarters, they are invariably to state their concurrence—or otherwise—adding such additional observations, based on local knowledge, as may be necessary to enable the authorities to come to a final decision on the question without further reference and correspondence.—*Q.R.*

**Correspondence between Officers in Command.**—In direct correspondence between one general officer and another, between commanding officers, and between heads of departments, letters are to be signed by the superior officers, and not by their staff or subordinate officers. When an officer employs his staff to conduct any correspondence with another officer of equal rank or position, the staff of that officer is to be addressed. As a staff officer carries on his duties under the authority of the general officer to whose staff he is attached, he will, in communicating with those under the command of the general officer, invariably sign “By Order.”—*Q.R.*

**Opening of Official Correspondence.**—Whenever general or other officers in command obtain temporary leave to be absent from their divisions, brigades, or stations, the officers next in command are to open any official letters that may arrive addressed to such officers, and to carry out any orders that may be contained therein.—*Q.R.*

**Unnecessary Correspondence.**—General officers in command are recommended to avoid everything which has a tendency to multiply unnecessary correspondence with C.O.s. of corps, such as the calling for returns and other documents not specified in the regulations of the service, and which are not essential to the efficient exercise of command.—*Q.R.*

Clerks at head-quarter offices are naturally desirous of obtaining from out-stations returns which will simplify and save time in the compiling of returns to be rendered from their offices; acting on the same principle, there is a tendency to call for information which is already in the head-quarter offices.

Letters and applications from officers of the M.S. for the D.G. will be transmitted through their immediate superiors.

All reports and documents of a professional and scientific character are directed to be in the handwriting of the M.O. who furnishes them.

Opinions based chiefly on personal observation of facts are usually in the form of “certificates”; suggestions, recommendations, or opinions in connection with a knowledge of events derived from other sources of information, are usually made in the form of a “report.” In a widespread army like ours, with a critical public demanding statistics, voluminous correspondence and complex returns are necessarily connected with the duties of the A.M.D.; but voluminous correspondence within districts

which a knowledge of regulations and the usages of the service would render unnecessary ought to be suppressed.

**Registering Correspondence.**—The General Register, A.B. 193, for correspondence, is the most important book in an office. In this book all entries should be carefully made. Herein are shown from whom documents are received, an epitome of the subjects to which they refer, with the number of enclosures and how disposed of—whether they be retained in the office or transmitted. Original correspondence is generally retained at the central office, where it is not usual to keep copies, unless they are of importance or sent out of the district or command. It is unnecessary for a M.O. in charge of a hospital in a district, to copy *in extenso* correspondence which will be retained at the P.M.O.'s office. Documents received in an office are the property of that office, unless they come from a higher office, marked "to be returned"; when so marked it is not necessary to copy them at an inferior office, but their purport and disposal should be recorded in the office register. As a rule, correspondence is retained at the office from which it emanates.

An ordinary official letter is not a confidential document, but if the information it contains is of such a nature as mentioned in sec. 26, it may be a breach of military trust to make improper use of it.

**Orders and Instructions—Framing and Issuing.**—To correctly frame orders is a matter of great importance. All orders should be clear, brief, precise, and complete, so that they may be readily understood. The higher class of orders should be characterised by brevity, without minutia of detail. These orders are frequently issued in connection with a statement of their object, purport, or the general idea they are intended to convey. Descending in the scale, clearness and precision are required, while that minutia of detail which is within the province of the immediate C.O. ought to be avoided in the higher order of command, or intermediate chain of command.

The principle upon which orders are thus issued by the higher authorities is well expressed as follows:—"They must contain only what a subordinate cannot order on his own account. If the subordinate is ignorant, he must learn; if he won't learn, he must be put aside."—*Von Moltke*.

Instructions express the views and wishes of superior authority, and are issued for guidance; they are less binding than orders which are more positive and detailed. Thus, as a rule, a superior draws up instructions, and the subordinate orders the details.

Those who frame orders or instructions should confine them to matters within the sphere of their own office. Care must be taken not to exceed their powers, or infringe those of subordinates so as to weaken theirs. They should not ask to be furnished with reports or returns to which their office is not entitled, and thus trespass within the domain of a superior

authority. Neither should they unnecessarily dictate those details of duties which are within the province of immediate C.Os. to order.

If a superior apply to an inferior for information he is not entitled to receive, should it be refused there is no offence committed (*see* sec. 26 (2)). Here much will depend upon the nature of the information required. The superior is responsible for his orders. The general rule is: obey *first*; remonstrate, and report the circumstance.

Orders conveying blame or censure should not be hastily written; thus the danger attendant on first impressions or prejudices may be avoided. The principles of justice demand that every charge against an accused person should be made in his presence, and in all fairness no person should be censured without a hearing.

"An order is short when it does not contain one word too much; complete, when there is not a syllable wanting; clear, when it can be comprehended at once by the meanest intellect; precise, when it answers the questions—from whom? to whom? and where?"—*Von Hardegg*.

For offences relating to orders and the necessity for republishing regulations, etc., *see* pp. 23-4.

Our military system is essentially constructive and very conservative, hence custom and usage occupy a prominent position in its administration. It is an established custom, if not a fundamental principle, that all officers on joining the army for the first time are appointed to the lowest rank; within the army this is recognised whenever exchanges of corps take place. Further, should a N.C.O. from a regiment elect to join the M.S.C., he must resign his rank and join as a private; if this were not so, those who joined the corps as recruits would be superseded. M.S. officers have seniority among themselves, and attain to the privileges conferred by rank after the manner of all other officers; thus it is either earned by length of service and proved efficiency, or granted as a reward for special military services. However, the system recently introduced of gazettement M.Os. of the auxiliary forces into the regular forces, and conferring on them an equivalent of high rank in the army on first appointment, seems to infringe the general principle here mentioned. Again, the system of accepting a civil qualification as indicative of proficiency in the administration of military affairs is a novelty.

## CHAPTER VI.

## PAY, CLOTHING, AND SERVICE RECORDS.

**Pay.**—The general nature of the duties of the Army Pay Department is stated in the Financial Instructions thus:—The duties of the Army Pay Department will be to receive, disburse, and account for, moneys receivable and payable for military services, and to carry out such other instructions as may from time to time be issued for their guidance.

Officers of this department are, as it were, the agents of the Accountant-General, an officer holding a permanent appointment under the Financial Secretary.

In each military command, division, or district is a chief paymaster or a district paymaster; they conduct all non-regimental cash transactions in the command or district, and are charged with the payment of all staff and district services.

**Station Paymaster.**—To certain stations at head-quarters of regimental districts station paymasters are appointed. They are charged with the payment of all regular troops quartered in the district who are not in the payment of a paymaster appointed for the purpose.

The station system introduced on the 1st January 1890 has the advantage of pay lists, being pre-audited at each district head-quarters, where all corrections deemed necessary can be made and local accounts adjusted before submission to the War Office.

**Regimental Paymasters** keep their accounts direct with the War Office, and are called "accountants"; any one with whom they are in account, such as captains of companies, etc., are "sub-accountants." Although regimental paymasters conduct business with the station paymaster in whose district they are quartered, still this officer has nothing to do with the internal accounts of regiments. When stationed abroad the district paymaster in the command exercises a general supervision over regimental accounts.

Paymasters of artillery, engineers, cavalry and infantry, send in to the Accountant-General, War Office, monthly pay lists and statements of accounts. To meet current expenses they receive Treasury drafts four times a month.

Officers of the M.S. serving in the United Kingdom are paid by an army agent, Messrs. Holt, Lawrie & Co., who are accountants to the War Office. In order that the agent may receive the necessary sums to meet payments, P.M.Os. forward to the D.G., for information of the War Office, a monthly return of



officers serving in their districts, on A.F. C 340, by the 20th of each month. Army agents send in estimates of the sums required for payment of officers.

All staff and departmental officers are paid monthly in arrear. Like district paymasters army agents draw one month in advance to meet current expenses and the demands which will be made on them at the close of each month. Agents furnish their accounts quarterly to the Financial Secretary.

**Quartermasters of the Medical Staff** are appointed to districts by the D.G. The district Q.M. is a sub-accountant to the station paymaster of the military district. He is charged with the payment of the M.S.C. in the district. He receives advances in cash four times a month for this purpose from the station paymaster. All men serving in a military district belong to a Financial Division of the corps. All communications on routine questions of pay, allowances, and accounts generally, whether at home or abroad, will be addressed by him direct to the station paymaster. O.Cs. of detachments send sub-pay lists to him, from which he compiles his pay list for the station paymaster.

**“District Quartermasters** will render annual Savings’ Bank accounts of the divisions or detachments paid by them, through P.M.Os., direct to the Finance Division of the War Office. Savings’ Bank accounts will be prepared in accordance with the special instructions applicable to the R.A. and R.E., given in the Regulations for Military Savings’ Banks.

“They will report to the paymaster without delay when warrants are issued by them to enable the wives (and families) of soldiers of the corps on foreign service to proceed to a port of embarkation for the purpose of joining their husbands, in order that the paymaster may stop the issue of separation allowance.

“They will report to the paymaster when a militiaman, who has been found to be serving in the corps without having previously obtained a release from his militia engagement, is retained for service and placed under stoppages.”—A.O.

The Q.M. will render all accounts and returns immediately they become due. Pay lists are due on the 3rd of the month succeeding that to which the account refers.

At home and at foreign stations the Q.M. sends in his sub-estimates to the district paymaster on the 7th of each month prior to that for which they are intended. Such estimates assist the district paymaster in calculating the amount of money he will require from the Treasury, or Colony Chest if abroad, or to enable him, if at home, to send in ten days in advance of the following month an estimate to the Financial Secretary of the sums of money necessary for his office and the instalments he may require.

Paymasters will inform the district paymaster whenever they have received money which will render the usual remittance

unnecessary, but "no paymaster will take charge of any regimental or other funds, except such as are sanctioned by regulations."

Whenever soldiers are transferred from the payment of one paymaster to that of another, a separate No. 1 Report will be made out for each man on A.F. O 1812, a duplicate copy of which is attached to the pay list. This report will be accompanied by a Statement of Accounts on A.F. O 1811, which is the same as a copy of a ledger sheet, and also a Savings' Bank Transfer Statement, A.F. O 1754, which should agree with the entry in the soldier's pocket ledger.

At stations abroad the sub-accountant receives money from the paymaster in charge of the Colony Chest, as do all regimental paymasters in the command. The necessary cash is obtained on A.F. O 1772. With the exception of pay and allowances, a paymaster neither receives nor issues money without "taking" and "receiving vouchers." The paymaster on receiving money takes with it an account signed by the person paying it, which becomes a debit voucher. On his paying money away he takes a receipt, which becomes a credit voucher to his accounts. Whatever money he receives is entered in the debit or left-hand side of each folio, and all payments on the right-hand side.

All men of the corps serving abroad are considered as on detachment. In the absence of a Q.M. the detachment is ordered to be attached for pay to some corps with which they are serving. The general or other O.C., on application, will direct to what corps they are to be attached.

Warrant officers are not permitted to act as sub-accountants, although they may be otherwise available to perform the duties of a Q.M.

**Imprests** are advances made by paymasters for the purpose of defraying current expenses: for instance, on the march an officer may require money for the settlement of claims for billeting or for the payment of his men. An officer receiving an imprest, if not already a sub-accountant of the paymaster, becomes one on receipt of it, as an account is then opened with him in the paymaster's books. If the imprest is one for a special temporary purpose, made to an officer not usually a sub-accountant, after the service is performed and the money accounted for he ceases to be a sub-accountant. Imprests are sometimes given to the heads of departments or officers in charge of hospitals for the purpose of meeting small current expenses, and an account is kept which is balanced periodically. The officer receiving an imprest under these circumstances is a permanent sub-accountant. Imprests are issued on the authority of the War Office; abroad or on service, on the authority of the G.O.C. No officer can refuse to receive an imprest, but the concurrence of the senior officer of his corps should be obtained

to the issue before such a duty is imposed upon him. Many M.Os. on service in Egypt suffered a loss by reason of their not having been aware of the nature of an imprest, and neglecting to close their accounts at the earliest opportunity.

**Pay, Medical Staff Corps.**—The following is from the R.W., which fixes the pay, departmental pay, and extra duty pay of the M.S.C.

					Daily.	
<b>Ordinary Pay:—</b>					s.	d.
Warrant officers	-	-	-	-	5	6
Staff-sergeant, 1st class	-	-	-	-	4	6
Staff-sergeant, 2nd class	-	-	-	-	4	3
Sergeant	-	-	-	-	2	8
Lance-sergeant	-	-	-	-	2	4
Corporal	-	-	-	-	2	1
Lance-corporal	-	-	-	-	1	5
Private	-	-	-	-	1	2
Bugler	-	-	-	-	1	2
Boys, until they attain the age of 18 years					0	8

2nd class staff-sergeants who were promoted to that rank before the 1st August 1884 still retain their old rate of pay, viz., 4s. 4d.

**Departmental Pay.**—To all below the rank of staff-sergeants who are present and effective at their posts, in addition to their ordinary pay as soldiers, departmental pay will be issued at the following rates:—

s.	d.	Classified for Distribu- tion thus:	s.	d.
1st rate, 1	0		Sergeants & lance-sergeants	1 0
2nd „ 0	8		Corporal or lance-corporal	0 8
3rd „ 0	6		Private, 1st class orderly	0 8
4th „ 0	4		„ 2nd „ „	0 6
			„ 3rd „ „	0 4

Buglers with regard to this pay are treated as 2nd class orderlies.

**Departmental Pay, when not Issuable to Medical Staff Corps.**—R.W. 670. Departmental pay shall not be issued to N.C.Os. or men of Our M.S.C. in the following cases:—

1. While on the sick list, in hospital, or in quarters, or proceeding as invalids on board ship.
2. While employed as officers' servants or as canteen sergeants.
3. While on board ship, unless actually employed.
4. While liable to forfeiture of pay under Art. 824. See page 111.
5. While confined to barracks or camp, or under stoppage of liquor ration on board ship, although they may be employed in departmental duty while undergoing such punishment.
6. During absence either with or without leave.
7. While under detention, charged with an offence of which they are afterwards found guilty.

8. For any day or days on which they may be awarded an entry in the regimental or company defaulters book.

N.C.Os. and men of Our M.S.C. in receipt of departmental pay shall not receive any allowance for extra time.

**Recruits.**—Privates of the M.S.C. shall draw the lowest rate of departmental pay for the first six months of their service, and, if recommended, will then be eligible for advancement to the next higher rate, provided that they have passed a satisfactory course at the Training School, M.S.C., Aldershot, and are reported qualified in departmental duties.

**Transfers from Regiments to the Medical Staff Corps.**—All N.C.Os. and men joining the corps as probationers are treated in the same way as recruits as regards their special training, and draw the lowest rate of departmental pay for the first six months. If transferred abroad the period of probation is the same, and local training may be substituted for that at the Training School. N.C.Os. on transfer have to resign their rank.

**Claims for Departmental Pay.**—On promotion of an orderly to a higher grade, the increased rate of departmental pay cannot be issued until the authority of the D.G. is received. The first claim for departmental pay for 1st and 2nd class orderlies will be vouched by the original authority of the D.G., and is the only voucher required to support the charge of payment. The advancement of men to a higher grade is published in corps division orders, where the number and date of the authority is quoted.

**Reduction.**—Whenever an orderly is reduced from a higher to a lower grade by his C.O., under R.W. 675, a report will immediately be sent to the C.O. of the division, if at home, or detachment if abroad, for confirmation. The different rates of departmental pay are affected by this reduction.

When through misconduct or otherwise a N.C.O. or man loses his ordinary pay, departmental or extra-duty pay, a return showing the period of forfeiture, and an extract of the detachment order by which it is affected, must be sent to the sub-accountant of the division at the end of each month on A.F. O 1810. This return becomes a voucher to his pay list.

**Extra-Duty Pay.**—Art. 707 R.W. states the rates for M.S.C., including the Volunteer Medical Staff Corps, as follows:—

	Daily.
(1) A N.C.O. acting as chief wardmaster of the Lunatic Hospital at Netley - - - -	s. d. 1 6
(2) N.C.Os. and men employed as clerks at the War Office, London - - - -	0 6
(3) N.C.Os. specially employed as instructors at the Depôt and Training School, Aldershot - -	0 6
(4) N.C.Os. not above the rank of sergeant, and men employed as compounders of medicine - -	0 6



Daily  
s. d.

(5) Corporals or privates employed as lunatic attendants	0	4
(6) N.C.Os. and men employed as special attendants on cases of contagious or infectious disease requiring the isolation of both patient and attendant	0	4
(7) Mortuary orderlies, where such appointments have been specially approved	0	4
(8) Sergeants employed as compounders on board troopships proceeding to and from India	1	0
(9) Corporals employed on board troopships proceeding to and from India	0	4

Soldiers of Our M.S.C. employed in a double capacity shall not receive more than one of the rates of extra-duty pay above enumerated.

Extra-duty pay shall not be issued to soldiers of Our M.S.C. in receipt of departmental pay or working pay (except in the cases above enumerated), or when situated as defined in Art. 670.

**Acting Appointments.**—A soldier below the rank of sergeant not belonging to the M.S.C., A.S.C., or Ordnance Store Corps, when necessarily employed in hospital or on board ship as acting wardmaster, assistant wardmaster, steward, assistant steward, ward orderly, cook, or assistant cook, shall receive extra-duty pay at 4*d.* a day. Sergeants, or N.C.Os. above that rank, when employed on hospital duties shall receive extra-duty pay at 1*s.* a day.

For further particulars regarding departmental and extra-duty pay, see **Financial Instructions**. All pay of men M.S.C. serving in a division is issued by the district Q.M.

**Application for Extra-Duty Pay** for the M.S.C. is made on A.F. I 1228. This application should be made immediately the duty is commenced, as pay will only be granted from the date of application. The D.G. authorises the issue. Extra-duty pay is drawn on A.F. O 1645, which becomes finally a voucher to the pay-master's accounts. In the case of a compounder of medicines, the application for his extra pay will be made on a separate copy of the above form, which is used for all classes of extra-duty pay. The authority of the D.G. must in all cases be obtained before the first issue of this pay; this authority in original is attached to the pay list as a voucher in support of the issue, and the number and date of the authority are quoted in subsequent pay lists. Should a compounder cease to perform this duty, on resuming his duty fresh authority will be required.

**Regimental Orderlies.**—The employment of soldiers in lieu of or in order to supplement the establishment M.S.C. at home is sanctioned by the D.G.; if abroad, these men are employed and paid under the authority of the G.O.C. The

same A.F. O 1645 is used in drawing this pay as in the case of the M.S.C., but payment is made by the district paymaster of the military command. The soldier's signature must invariably be obtained to the document; this is not necessary in the case of the M.S.C. Authority for the employment of soldiers as above is granted on A.F. I 1229.

When soldiers are employed in attendance on sick during a voyage home, application for their extra-duty pay will be made by the M.O. in charge of ship on A.F. I 1229, which will be forwarded with A.F. O 1645, through the P.M.O. at the port of disembarkation, for approval of the D.G.; the claim will be paid by the paymaster at Netley. Whenever men are employed in this way on a voyage out, the claim will be adjusted locally at the port of disembarkation, in the same way as if the men had been employed in a hospital on shore.

**Good Conduct Pay and Badges.**—G.C. pay is an additional pay granted to soldiers below the rank of corporal as a reward for good conduct. The *test of good conduct* is in the absence of entries in the regimental defaulters' book. A G.C. badge is a mark of distinction worn on the left arm; to each G.C. badge is attached one penny a day pay. The regimental defaulters' book is a guard book, which contains a sheet for every N.C.O. and man.

**Term of Good Conduct.**—Art. 994 states: "A 'term of good conduct' shall consist of a period of two clear years, and a 'half-term of good conduct' of one clear year, during which no entry has been made against a soldier's name in the regimental defaulters' book. Such clear years or year shall reckon from the date on which punishment has been last awarded, unless the offence last entered involved imprisonment or absence of a nature to be made a regimental entry under Art. 1212 in the soldier's record, in which case the 'term' or 'half-term' shall only commence from the date of the termination of such imprisonment or absence. Service in Our army reserve shall not reckon towards a 'term' or 'half-term' of good conduct."

**Qualifications for Good Conduct Pay and Badges.**—Qualification *by Length of Service* for G.C. badges.—All service counts from date of attestation, but not former service if re-engaged since 1880. The following periods of total service shall be necessary to render a soldier otherwise qualified eligible for G.C. badges:—

After 2 years' service he may hold	-	One badge.
6	-	Two badges.
12	-	Three "
18	-	Four "
23	-	Five "
28	-	Six "

**Qualification by Character.**—If a soldier's name shall not have been entered in the regimental defaulters' book for 14 years he

shall be entitled to hold badges, if otherwise qualified, after periods shorter severally by two years than those stated.

There are certain periods which shall not come within the definition of qualifying service towards a badge, although the soldier may not be absent without leave or in prison.

For every day on which he is in hospital on account of sickness certified by a M.O. to have been caused by an offence under the A.A.; also the day on which a soldier is discharged from prison is not reckoned—he receives no pay for that day. A N.C.O. reduced for an offence, if previously in confinement, shall not receive pay for the day of reduction; neither can this period be reckoned towards G.C. pay; the conviction also deprives him of a G.C. badge. A district C.M. can deprive a soldier of all or any of his G.C. badges or deferred pay already earned. Terms of good conduct may also be affected by sentence of a C.M. depriving him of his past service towards pension.

Art. 1212 further states the periods not reckoned as qualifying service towards G.C. pay.

Under no circumstances can this pay be drawn for any day on which a soldier does not receive regimental pay.

**Reckoning of Service for Good Conduct Pay.**—The following service shall be allowed to reckon towards G.C. pay:—

(a) All service with the colours allowed to reckon towards discharge or transfer to Our army reserve.

(b) Previous service in Our regular forces which counted towards G.C. pay:—

In the case of a soldier rejoining Our regular forces from Our army reserve—from the date of rejoining.

In the case of a pensioner re-enlisted—from the date of re-enlistment.

(c) In the case of a soldier improperly enlisted from Our army reserve, but on the detection of the offence retained with Our regular forces, and not re-transferred to the reserve—service from the date of his improper enlistment.

For further particulars *see* Art. 992, R.W.

**Forfeiture of Badges.**—One G.C. badge if held by a soldier is forfeited for each entry in the regimental defaulters' book. This forfeiture is reckoned from the date of the *award* which caused the entry to be made. This forfeiture includes the loss of any portion of a "half-term of good conduct" which the soldier may have given towards the restoration of a badge or badges previously forfeited. *See* p. 122.

**Restoration of Badges.**—A soldier who forfeits a G.C. badge, except under certain circumstances defined in the R.W., regains it by completing a "half-term of good conduct, provided that, if he has lost more than one badge, he shall complete a half-term of good conduct from the date of losing the last badge

forfeited before he shall be eligible to have one badge restored, and shall complete another half-term before the second lost badge can be restored, and so on."

A soldier not qualified by length of service to receive a badge, in case of his being punished to such an extent as to entail a regimental entry, must serve a full term of two years from the date of the award which occasioned the entry before he is entitled to receive a badge. In the event of his being in possession of a badge at the time of the award, the entry causes a forfeiture of the badge, but only a half-term or one year's service is required before he is eligible to have it restored; but another entry made before this badge is restored will require a second half-term from the date of the second award before it can be restored. If a soldier has two badges, the first award as above deprives him of one, and a second award before this badge is restored will deprive him of the other, and prolong the time of restoration of the first till he completes a half-term from the date of the second award, and the restoration of the second till a half-term from the date of restoration of the first badge, and so on, in case a soldier happens to have three or more badges.

The increased rate of pay received by N.C.Os. is considered to include G.C. pay. In case of reduction to the ranks they receive the G.C. pay to which they are entitled by length of service, less 1d., which is forfeited in consequence of the entry necessarily made in the regimental defaulters' book. The same occurs whenever a N.C.O. is reduced by a special order of the C.-in-C. for a crime. If reduced on account of incompetency there is no loss of pay or badges.

**Authorising Good Conduct Pay.**—Such pay for men of the M.S.C. is granted locally by M.Os. in command of detachments. An extract of the order authorising the pay should be forwarded to the paymaster at the end of the month on A.F. O 1810. The officer holding the man's regimental defaulter sheet and copy of attestation is responsible for authorising this grant, and this in all cases is the man's immediate C.O.

**Deferred Pay, Definition.**—R.W.—Deferred pay shall be an additional payment for past services issued to a N.C.O. or soldier when—

- (a.) Discharged.
- (b.) Transferred to the army reserve before discharge.
- (c.) Promoted to be a commissioned or warrant officer.
- (d.) Being a N.C.O. in the rank of sergeant, or any higher rank, he completes 21 years service.

**Rate.**—The rate of deferred pay shall be 3*l.* a year, or in the case of periods less than a year 5*s.* for each complete period of 30 days or remaining portion of such period: and the service for which granted and the conditions of the grant as laid down.

**How Earned.**—"Deferred pay shall be issued for the first 12 years of a soldier's service with the colours, reckoning from the



date from which the soldier reckons serving for the purpose of discharge or of transfer to the reserve."

**Forfeiture.**—Deferred pay at the rate of 2*d.* a day is forfeited for every day forfeited towards pension, or by sentence of court-martial, or as otherwise ordered. Deferred pay is liable for stoppages, public or regimental debts and also fines, which are the last claims chargeable.

**Restoration.**—Restoration of forfeited service carries restoration of deferred pay with it. Deferred pay is not issued to a warrant officer or a boy under 18 years of age, or a soldier enlisted for three years with the colours, unless he extends his service at the expiration of this period.

**Interest.**—Men who enlisted before the 30th June 1881 are allowed simple interest at  $2\frac{1}{2}$  per cent per annum on the deferred pay due to them at the end of six years; should a soldier continue to serve after 12 years, interest is allowed on the further amount of deferred pay earned. This will amount to deferred pay 36*l.* with interest, about 39*l.* in all. In the event of a soldier being promoted to the rank of sergeant, he will not receive interest on his deferred pay after 12 years service.

**Transfer to Reserves.**—When a soldier is transferred to the reserves or discharged, the balance of his deferred pay, after the deduction of all legal charges made against it are settled, will be paid or remitted to him by the paymaster in whose payment he is at the time of transfer or discharge. A soldier discharged while serving abroad, should he desire to remain in the colony, receives the full amount of his deferred pay, or if discharged at home and about to go abroad immediately after discharge. Otherwise the sum of 1*l.* is issued to him, and the balance remitted by Post-office order or cheque if desired.

**Claims for Deferred Pay** are prepared on A.F. O 1616. On the front page is a record of service; when completed and signed by the C.O., it is forwarded through the P.M.O. to the officer charged with the payment of the man. The deferred pay statement on the back of the form is then completed by the latter officer and forwarded to the chief or station paymaster, as the case may be, for pre-audit; in either case the document will be returned, and when the money is paid and receipts obtained, A.F. O 1616 and A.F. B 140, together with the soldier's receipt, become vouchers to the pay list.

**Payments.**—A N.C.O. promoted to be a warrant officer, or on completion of 21 years service, is entitled to receive his deferred pay. In the event of a soldier dying in the service, any deferred pay which was due to him is paid to his representatives. Non-effective documents are prepared on A.F. O 1625, in which the amount of deferred pay is recorded; A.F. B 140 accompanies this form. When deferred pay is paid by cheque, the cheque will be accepted as proof of payment if forwarded as a voucher to the pay list.

If a man for any reason improperly enlisted is *held to serve*, he counts this service towards deferred pay; otherwise if discharged or re-transferred to the reserves he has no claim.

As to men who purchase their discharges, those enlisted previous to the 1st July 1881 can claim deferred pay, while those enlisted since that date are not so entitled to this pay.

**The Reserves and Pensioners, Medical Staff Corps,** are paid by the officer paying pensioners, Chelsea Hospital, irrespective of their place of residence.

We see there are many different descriptions of pay in the army, where all are given on account of services rendered. Ordinary pay, as before mentioned, is very distinct from other pay—departmental pay, extra duty pay, and working pay. Both on account of the conditions under which they are earned, and by reason of their nature and the way in which their issue is authorised, they can with facility be mulct by a C.O. Absence from duty due to any cause, and the award of a minor or other punishment, always affects this pay. Like command pay in the commissioned ranks, these issues of pay are regarded more as a gratuity than as a fixed income.

**Allowances.**—There are many allowances to which officers and soldiers are entitled, and these have all got their money equivalent, which may be issued under various circumstances in lieu, or may be given to cover expenses incurred by the service; but money issued thus as an allowance is distinct from pay.

The following are some allowances to which soldiers may become entitled:—

**Allowances in respect of Clothing** in lieu of free kit, or compensation in lieu of issue of clothes or boots, etc.

**Allowances in respect of Subsistence**—6*d.* a day in lieu of rations in certain cases when out of mess; 6*d.* a day on line of march in lieu of rations or a hot meal in billets; 6*d.* a day in lieu of subsistence for days in custody pending trial if subsequently acquitted of the charge; in billets, should a soldier be similarly under arrest, 10*d.* will be allowed. For a soldier released from prison, if a ration cannot be conveniently issued for the day, 6*d.* will be allowed for his subsistence.

**Separation Allowance**—4*d.* to wife if on married roll, and 1½*d.* to each girl up to 16 and boy of 14 years of age; this rate is doubled if the husband is ordered abroad and the wife has to live out of barracks.

**Lodging Allowance** is issuable to soldiers where public quarters are not available, for the purpose of enabling them to provide themselves with accommodation. The rates of lodging money are laid down in para. 339, Allowance Regulations, 1887, and cannot be varied without the prior authority of the Secretary of State.

**Fuel and Light Allowance** is also issuable similarly and concurrently with lodging allowance; it is payable monthly in arrear.

**Marching Allowance** is travelling allowance to N.C.Os. and men proceeding by route march—3*d.* a day for dismounted services, 1*d.* for mounted, when the distance marched is not less than 10 miles.

No allowance for days of halt, or when rationed, or when in billets; 3*d.* is allowed if marched on foot five miles to a railway station in connection with a railway journey of not less than 100 miles.

A day's marching allowance is also given to soldiers called out in aid of the civil power if absent from barracks for seven hours.

The rate of 10*d.* is laid down for railway journeys according to the distances travelled, commencing at 10*d.* for 150 miles, but no journey is to be charged for beyond four rates=3*s.* 4*d.*

There are special rates for mixed journeys by land and water.

A warrant officer gets travelling allowance on the same form of claim as officers. The full rate varies from 6*s.* to 4*s.* a day according to class. Half-allowance is only to be charged on change of station when the journey can be accomplished in one day.

**Stoppages, Fines.**—A soldier is stopped under sec. 138, A.A., all sums necessary to make good any loss, damage, or destruction of Government property, including his clothing, necessaries or decorations.

The sums charged against him must only be sufficient to replace or repair such articles as are lost by him or injured otherwise than by fair wear and tear. The stoppages are not penal deductions from his pay or forfeitures.

A soldier is only fined in cases of drunkenness by his C.O. or a C.M., but he may be fined otherwise by a civil court; fines are the last charges made against his pay, which, after all deductions, must leave him 1*d.* a day clear.

A C.O. can fine up to 10*s.*, a court-martial 1*l.* Fines are usually recovered from a soldier's pay thus:—

Under 10*s.*, 3*d.* a day; 10*s.* and over, 4*d.* a day; also in the case of soldiers under stoppages for two fines simultaneously. A fine of 7*s.* 6*d.* and upwards gives a regimental entry.

A soldier, if he does not draw his spirit ration on board ship, may forfeit, as a punishment, the 1*d.* a day given him in lieu of the ration; this, although apparently a minor punishment, touches his ordinary pay, and causes a regimental entry should it exceed seven days.

**Allowances to Wife and Family.**—Sums may be stopped from a N.C.O. or soldier for the support of his wife or child (legitimate or otherwise)—sergeants 6*d.* and rank and file 3*d.* a day.

Under circumstances where the Government grant a *Separation Allowance*, in addition a soldier must contribute to the support of his wife and family sums varying according to rank and the circumstances under which he is placed, whether in receipt of ordinary or field rations or on board ship.

If on married roll, sums charged against pay, called *allotments*, under ordinary circumstances are, when on field rations—sergeants 8*d.* for wife, 1½*d.* for each child; rank and file 4*d.* for wife, 1*d.* for each child—maximum not to exceed 1*s.* for sergeants, and 6*d.* a day for rank and file, without their consent.

If rationed on board ship or supplied with the ordinary bread and meat ration, sergeants 4*d.* for wife and ½*d.* for each child, rank and file 2*d.* for wife and ½*d.* for each child—maximum not to exceed for sergeants 6*d.*, and rank and file 3*d.* a day, without their consent.

No deduction from a soldier's pay can be stopped for children over 16 years of age.

Should a soldier forfeit his pay from any cause, the stoppage for the days it is forfeited will remain a charge against him.

“The full amount of any stoppages due to the public to which a soldier becomes liable will at once be entered against his name in A.F. 2 of the pay list, and credited to the public.”

**How Payments are made to Men of the Medical Staff Corps and Accounts rendered.**—The accounts of officers commanding troops, batteries, and companies, both with the men under their command and with the paymaster, will be kept on A.F. N 1504 pay and mess sheet, and on A.F. N 1505 monthly pay list and ledger combined.

The following is a copy of the instructions for C.Os. with reference to the keeping of pay lists A.F. N 1505, issued with A.O. 146, March 14th, 1888.

1. A separate space of three lines is to be allotted to each man's name.

2. The names of all men borne on the strength of the troop, battery, or company on the last day of the prior month will be entered according to rank in alphabetical order. In every case of succession, the name of the individual succeeded will be shown in the “Remarks” column.

3. The names of men who join after the day on which the pay list begins will be entered according to rank in chronological order (*i.e.*, according to the dates on which they severally come into payment) after the names of those who were present on the last day of the period of the prior pay list.

4. The names of all men *attached* for pay, &c., should be shown after those of the men belonging to the troop, battery, or company.

5. The names of all N.C.Os. detached for duty with, and paid by, other companies, &c., will be retained in the pay lists so long



as they remain on the establishment of the troop, battery, or company.

6. When a soldier is transferred from one company to another, or from one regiment or corps to another, his account is to be closed as follows:—If it shows a debtor balance, the amount of such balance will be entered in the column headed “Other Company Credits,” with the note “Charged against — company or corps,” and the amount so shown will be charged against the company to which the soldier is transferred in the general state (form 5) of the pay list. If, on the other hand, the account shows a creditor balance, the amount of such balance will be entered in one of the blank columns headed “Regimental Bills” in the pay and mess book, and credited to the company or corps in the general state of the pay list. In either case a certified copy of the soldier’s account will be forwarded with him to his new company or corps on A.F. O 1811.

7. The soldier’s signature will be written in the final column on form I. of the “duplicate pay list” *only*, and the O.C. will at the same time sign the account as a proof that he actually saw the man affix his signature after having had the account read over and explained to him.

Men who cannot write their names are to make their marks in presence of the officer and of a third party (not the pay sergeant), who is to sign as a witness.

8. Erasures are strictly forbidden. Any alterations that may be necessary will be made in black ink in such a manner as not to obliterate the original entry, and will be initialed by the O.C.

**Pay of Detachments, Medical Staff Corps.**—The pay accounts of a detachment of the M.S.C. in connection with the above order are conducted as follows:—

In the case of small detachments of 10 men and under, the accounts are kept on Pay and Mess Sheets A.F. N 1504, and Pay List A.F. N. 1505. One copy of each of these forms will be sufficient for the accounts of such a detachment for 12 months, but the pay list will be required in duplicate. However it is only necessary to use the inside sheets of these forms called 1 and 2; form 1 shows every item of pay, debits and credits, and form 2 shows what stoppages are due to the public.

In the case of large detachments full-sized forms are used each month.

The C.O. completes the accounts of all men on his pay list at the end of each month, after being signed by himself and the man whom he pays, in duplicate. One copy is forwarded to the district Q.M., the other he retains; but in the case of small detachments only the sheets 1 and 2 will be thus required.

The regulations with respect to pay which came into force on the 1st June 1889 simplify matters of pay very much. The best plan of keeping the office copy of the monthly pay list of a

detachment is to use one entire pay list, which contains 12 inside sheets, form 1, which will do for the whole year. Although not so stated in the instructions, a C.O. will do wisely to obtain the signature of the soldier to each weekly payment made by him, as in case of any casualty, etc., occurring with respect to pay during the month, he will hold receipts for all payments made.

For the weeks ending the 7th, 14th, 21st, and 28th, and at the end of the month, the C.O. of a detachment sends to the district Q.M. an estimate for pay on A.F. M 1430, stating the sum which will be required to pay the detachment on those days. This estimate shows all pay and allowances, from whatever source derived, which is paid by the Q.M. or other officer in whose payment the men are, and who is responsible that the money so required is transmitted.

The number of each grade or class of N.C.Os. and men are shown on this estimate; it is not a nominal roll. As well as showing the total rate per diem to which each class is entitled as "estimated payments," there is a column for stating any stoppages under which the men may be as "estimated receipts," which being subtracted from the former gives the net total of the estimate.

The C.O. signs the pocket ledger of the soldier if he is in credit, the man signs if he is in debt or the accounts balance; this is done every month at the time the pay sheets are signed.

Accounts of men in hospital are signed regularly, but they do not receive pay.

Accounts of men on furlough are sent to them. Advances of pay are only made to men going on furlough.

Soldiers absent without leave have their accounts closed after 21 days.

Soldiers in prison have their accounts signed when they are released.

In the case of a detachment, M.S.C., the senior or a competent N.C.O. will act as pay sergeant.

**Clothing and Equipment**, on account of the difference in the manufacture of the articles of which they are made, are under separate administrations of the War Office. In these instances administration is founded on the nature of the raw material and its mode of manufacture. It is centralized—essentially so—in the case of clothing. Had these administrations been grounded on what is now their ultimate object, namely, the efficient supply of clothing and equipment to the soldier, or, in other words, if the ultimate object of administration became its primary object, the administration built up on it could be more decentralized, and, if for no other reason, it might become regimental. At present there seems to be a departure in these instances from the constructive principle necessary to guarantee the most efficient administration, yet, within certain limitations, it is practical in its adaptation to our military system.

The organization of continental armies and their *depôt* system for the supply of clothing and equipment will not suit us. On account of the different climates in which men are called upon to serve, our clothing is too varied; and our army, composed as it is of small itinerant units, is too cosmopolitan for such a system. Our regiments cannot be incumbered with the mass of stores, which are more economically, and with greater regularity and uniformity, supplied by a central administration than they would be if manufactured under local contracts and stored in districts or divisions.

Formerly these services were arranged for regimentally, and what money the colonel could make out of the transaction was looked upon as "off-reckonings," a legitimate profit in connection with his appointment. A modification of this system existed in India until recent years.

However set apart these administrations may be at starting, clothing and equipment belong to a class of articles which tend to fulfil the same purpose; thus practically they come together, and on this account we frequently find them embodied in the same paragraph of regulations, and dealt with collectively in regimental administration.

Clothing and equipment tend to render the soldier efficient as a fighting machine—the object for which he is maintained.

From a hygienic point of view, clothing and necessaries, as uniform and underclothing, are articles required for the health, comfort, and well-being of the soldier; in this way they contribute towards his efficiency.

Equipment of the soldier—arms and accoutrements—includes his weapons and the means of rendering them effective. Apart from surgical injuries connected with their employment, they come within the province of the M.O. As regards their mode of carriage on the person, and the correct distribution of weight, with avoidance of pressure over certain vital organs, such considerations are of a scientific nature, requiring anatomical, mechanical, and physiological knowledge.

I have elsewhere pointed out that undue importance has been attached to the wearing of clothing and equipment as a cause of origin of heart disease in the army.

I first advanced the view, which, so far as I know, has never been refuted, that the chief cause of heart disease and aneurism in the army was the mental and physical strain imposed upon the recruit while being manufactured into a soldier. The application of our system of changing a civilian into a soldier has been the cause, for years past, of much waste of men and money to the State.

The clothing and equipment of our troops belong to the public, and are not the property of the regiment or the soldier.

Regimental equipments, and all articles classed as "stores" which are held on permanent charge, are looked upon as belonging

to the corps, except clothing, necessaries, books, and stationery. Surgical instruments and appliances are special equipment in charge of the Medical Department.

Equipment is classed and recorded in the equipment ledger of the corps, and not taken on charge by the O.S.O. of the district in which the men are stationed.

The C.O. of a corps is a direct accountant to the War Office for the clothing and equipment of his corps. A soldier is individually responsible for what is issued to him, but has only a property use in the article he holds; it is not absolutely his property, although in his possession.

Equipment includes, as well as arms and accoutrements, appointments, great coats, and leggings.

**Clothing.**—The Director of Clothing is invested with the power of making contracts. He is a civilian official, whose headquarters are at the Royal Clothing Dépôt, Pimlico. Almost the entire work connected with clothing and necessaries for the army is done by civil labour at this dépôt, which is a factory as well as a store.

All materials, and occasionally made-up clothing, are got by contract. Unlike the infantry and other corps, cavalry are supplied with materials, which are made up regimentally.

All clothing, of whatever description it may be, comes from Pimlico—hospital and prison clothing, and suits of plain clothing for men discharged the service or passed on to the reserves.

The O.S.O. in a district, although general storekeeper for all stores used for military purposes, and for barrack and hospital equipment, has nothing to do with clothing and necessaries, except in the field or abroad. Nevertheless, in the case of "miscellaneous" clothing, such as hospital, prison, working clothes, etc., the reserve stock is held by the Ordnance Store Department, both at home and abroad; condemned clothing is sent to and sold by this department, generally to some one who contracts for it at a certain rate. The contract rates for clothing issued and chargeable at fixed regulation prices, and the prices fixed for part-worn clothing, have no relation to these contracts.

Dealing more particularly with the M.S.C. and the special regulations by which it is governed, it may be seen that the administrative M.O. of a district commands the division of the corps comprised within his district. His duties in relation to the pay, clothing, and equipment of his men are the same as those of an officer commanding a regiment, which is the typical administrative unit in the army. As C.O. the P.M.O. is the accounting officer for the clothing and equipment of the division shown in his Equipment Ledger, "Army Book 239," with the exception of Aldershot, where the C.O. of the 1st Division Dépôt



and Training School is accounting officer for the corps, and is also accounting officer for stores and equipment held for instructional purposes in connection with the depôt and training school.

Q.Ms. appointed to divisions or commands perform their duties under instructions from the P.M.O., as well as performing such duties in connection with the hospitals as may be required of them. "They will be responsible under him for all duties in connection with payment, clothing, and equipment of the corps in the district or command."

While framing the M.R. it is a pity the various duties of Q.Ms. were not more distinctly separated and kept apart from each other.

Duties relating to pay, clothing, and stores, are frequently treated of in the same paragraph.

From the very nature of things, duties relating to pay have no connection whatever with clothing, and they are kept quite distinct in regimental administration. Moreover, a warrant officer acting as Q.M. is not a recognised sub-accountant in matters of finance.

The Q.M., although responsible under the P.M.O. for the regular performance of routine duties relating to pay, is not so completely under his instruction in this as in other matters; for the financial responsibility rests with him directly, and it is provided they "will be guided in the performance of these duties by the rules laid down in the Financial Instructions."

Q.Ms. submit through the P.M.O. demands for clothing and necessaries, and receive stores and issue them; they should see that all issues are authorised by existing regulations; it is their duty to keep all books, records, returns, or other documents connected therewith. In these matters they act as the responsible agents of the C.O., but such duties as these with which they are entrusted do not relieve the P.M.O. of his responsibility as accounting officer to the War Office.

**Inspection.**—The P.M.O. of a district at his inspection is to satisfy himself that the clothing and equipment of the men within the district are complete in every respect. Officers in command of detachments are responsible to him that the equipment, clothing, and necessaries are kept complete by supplies procured either locally or from the district Q.M. on requisition as follows:—For clothing, on A.F. H 1152; for necessaries, A.F. H 1151.

In accordance with the Clothing Regulations, any necessaries required by the M.S.C. at foreign stations can be obtained on demand from regiments at the station in which the men are serving. This only refers to ordinary necessaries, not sea kits, which are obtained on demand from Pimlico.

All C.Os. may obtain necessaries from one another, provided they are of the correct pattern for their men, but sea kit

necessaries are not to be got in this way. A stock of sea kits is kept at the depôt at Aldershot for drafts of the M.S.C. proceeding abroad.

Officers commanding detachments are directed to make inspections monthly, or oftener if necessary, of equipment, clothing, and necessaries, and to be careful that the clothing accounts in each man's pocket ledger are signed regularly; the C.O. should sign this ledger on the man's receipt of the article.

The O.C. on handing over a command will furnish a certificate to the P.M.O. that the kits, arms, and accoutrements of the detachment are complete or otherwise.

**Transfer.**—On transfer of men from one district to another the C.O. of the detachment to which the men belong will obtain from the district Q.M. documents as under for each man, viz:—Transfer clothing statement, A.F. H 1157; equipment vouchers, A.F. G 1033.

This latter receipt and delivery voucher shows the equipment of any number of men proceeding from one division to another, but in the case of proceeding to or from foreign stations separate equipment vouchers must be prepared for each man. Return of accoutrements and necessaries, A.F. H 1118, which is a personal document special to the corps, should also accompany a man on change of station or other movement.

These documents are then forwarded, together with the copy of attestation, defaulter sheets, and other personal documents which are held by the C.O. of the detachment, to the P.M.O., who transmits them to the O.C. the division to which the party is proceeding.

Men ordered on foreign service are on all practicable cases transferred to the depôt at Aldershot, in order that they may be equipped and finally settled up with.

Regimental Q.Ms. keep all accounts connected with clothing and necessaries, but they have no direct dealing with the men, neither do they receive any money or conduct any cash transactions with them.

The P.M.O. commanding the corps in a district as accounting officer, is himself responsible for whatever stock of clothing, necessaries, or other articles may be in store.

Officers commanding are supposed to "control and supervise" the duties with which Q.Ms. are charged.

Q.Ms. ought not to be permitted to relinquish their charge by change of station or otherwise, without satisfying the C.O. as to the condition of their accounts and number of articles in store and on charge.

In regiments this is usually done by a board of survey every time one C.O. is changed for another, or whenever a change of Q.Ms. takes place.

At Home Stations, at Cold Stations Abroad, and in South Africa and St. Helena.	At Warm Stations.
1 helmet and bag, quadrennially. 1 tunic, biennially. 1 frock 1 pair of cloth or tweed } annually. trousers. 1 pair of tartan trousers, biennially. 1 pair of ankle boots (on 1st October), annually. \$1 pair of ankle boots (on 1st April), biennially. 1 pair of shoes (on 1st April), annually.  1 forage { warrant cap    officers } biennially. and staff sergeants } other ranks, annually.	1 helmet, triennially. 1 tunic, biennially. 1 serge frock 1 pair of tartan trousers } annually.  1 pair of tartan trousers, biennially. 1 pair of ankle boots (on 1st October), annually. \$1 pair of ankle boots (on 1st April), biennially. 1 pair of shoes (on 1st April), annually.  1 forage { warrant cap    officers } biennially. and staff sergeants } other ranks, annually.

Recruits or transfers from regiments to the M.S.C. may be supplied with part-worn clothing. Invalids may also be issued with part-worn clothing.

Period of supply, *vide* ch. 80, Army Circulars, 1884.

Articles.	1st Year on Enlistment.	2nd Year on 1st April.	3rd Year on 1st April.	4th Year on 1st April.	5th Year on 1st April.	6th Year on 1st April.
<b>If finally passed into the Service between 1st April and 30th September—</b>		New.	New.	New.	New.	New.
Tunic, part-worn, in first year's wear -	1	—	1	—	1	—
Or part-worn, in second year's wear -	1	1	—	1	—	1
Or new - - - - -	1	—	1	—	1	—
Frock, new - - - - -	1	1	1	1	1	1
Trousers, cloth or tweed, pair of, new -	1	1	1	1	1	1
"          "          "          " tartan -	1	1	—	1	—	1
Shoes, pair of, new - - - - -	—	1	1	1	1	1
Ankle boots, pairs of, new - - -	2	1	—	1	—	1

**Equipment** is a term used to denote the arms, appointments, great coats, leggings, etc., with which soldiers are supplied, and which always remain the property of the Government.

Any article of equipment returned into store may be re-issued as long as it is serviceable.

**Accoutrements.—**

1. Belts and pouches.

1. Belt, waist.

1. Sword.

1. Valise complete, { except for warrant officers  
and staff-sergeants.

1. Water bottle and strap.

Enamelled belts are issued to warrant officers and 1st class staff-sergeants, with cross belt and pouch, except the water bottle strap and sword knot, which are of buff. For all other ranks buff belts are used.

**Necessaries.**—A term applied to articles necessary to complete a soldier's kit. The following complement is required: the first issue of these articles is free, but subsequently they are replaced or kept up at the soldier's expense :—

Badge for Cap.	Bag, Waterproof, and Hook.	Blacking, Tins.	Brushes.	Braces, Pairs.	Blacking.	Brass.	Clothes.	Polishing.	Shaving.	Button, Brass.	Comb.	Cover, Mess Tin.	Fork.	Hold-all.	Knife.	Mitts, Pairs.	Razor and Case.	Shirts, Flannel.	Soap, Piece of.	Socks, Worsted, Pairs.	Sponge.	Spoon.	Tin, Mess.	Towels.	Pocket Ledger.	Regulations for Medical Ser- vices, Part II.	Bible and Prayer Book.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	1	1	1	2	1	1	1

Bibles and prayer books are issued according to the religious persuasion of the soldier; medals belong to kit.

White drill clothing, when issued at certain stations abroad, comes under the head of necessaries.

**Records and Correspondence relative to Clothing and Equipment.**—Q.Ms., it is provided, will prepare and initial as correct, for the signature of the P.M.O., all correspondence on such matters as clothing and equipment, and they will prepare for the signature of the P.M.O. the necessary demands for supplies of regimental clothing on the Director of Clothing, Pimlico, and for equipment on the local senior O.S.O. They are thus responsible for the correct keeping of the clothing and



equipment accounts of the district, and all correspondence connected therewith.

All returns and accounts of clothing and necessities will be rendered to the Director of Clothing, and of equipment to the Commissary General of Ordnance, Royal Arsenal, Woolwich.

The equipment will be accounted for in Army Book 239.

Soldiers' clothing is of three qualities:

1st class quality is issued to warrant officers and certain staff-sergeants.

2nd class quality is issued to sergeants.

3rd class quality to rank and file, including corporals.

The Clothing Regulations give a list of what soldiers are entitled to of each quality.

When a sergeant is reduced, he exchanges clothing if possible with the corporal who takes his place, otherwise he is treated for clothing purposes as a recruit, and the sergeant's clothing is returned to the Q.M.'s. store as "part worn."

Most of the clothing issued to the soldier is due to him on the 1st April each year. Articles which are to last for two or more years are also replaced on this date.

**The Annual Estimate of Clothing** for the corps in a district, as for a regiment, is sent to the Director of Clothing in duplicate, accompanied by the *size roll* in triplicate, of the men for whom clothing is required.

Each soldier in the army is measured once a year in presence of an officer, and his various measurements are recorded in his Small Book, from which size rolls can be made. The sizes of boots, caps and gloves should be given. **Boots** are sized from 5 to 10, clothing from 1 to 20.

Estimates for clothing in the United Kingdom should be sent in nine months before the date of issue; more time is required by regulation when men are serving abroad.

The requisitions for the 1st October issue of boots should be forwarded four months after the annual clothing requisition.

The district Q.M. ought to obtain through the P.M.O. from C.Os. of detachments, early in June, the size rolls to be submitted for signature of the P.M.O. not later than 1st July. It is important that these estimates for clothing be forwarded at the earliest possible date, in order that the clothing be received in time for issue early in April.

When military labour cannot be obtained for the fitting of clothing of detachments, M.S.C., application for authority for the employment of civil labour should be made at once, stating the alterations required; for this service a special allowance may be sanctioned by the Director of Clothing, in which case the tailor's bill will be accompanied by a statement to the effect that military labour was unobtainable.

**Requisitions** on the following forms should be prepared for transmission to the Director of Clothing, A.F. H, clothing for all services in duplicate, except size rolls in triplicate:—

H 1107. Tunics, frocks, trousers, chevron badges, etc.

H 1133. Size roll of tunics, frocks and trousers.

H 1100. Boots, shoes, and leather gaiters.

H 1108. Head dresses, helmets, caps, and gloves.

H 1111. Necessaries when required should be furnished quarterly at home, the first quarter commencing on 1st January in each year; at many stations abroad necessities are got half-yearly by regiments.

Such articles as **Great Coats**, which last for an indefinite period, are only replaced when necessary, ordinarily on 1st April. They should be requisitioned for on A.F. H 1101 in triplicate, accompanied by the proceedings of the board of survey which condemned the old coats.

Requisitions for clothing for time-expired men are made on A.F. H 1103, and for plain clothes for army reserve men on A.F. H 1153.

Intermediate requisitions for “immediate issue,” when the number of required articles is few, should be prepared on A.F. H 1173; when more numerous, on the usual forms.

Such requisitions for either clothing or necessities ought to be avoided as much as possible, but when sent in should be headed “*Supplementary*.”

**Depôts.**—Special rules apply to the supply of clothing to depôts.

There are two requisitions sent in at different periods—one for the permanent staff accompanied by size rolls, the other for the rank and file, and to meet the requirements of recruits joining, with this no size roll is required.

The supply is made half-yearly, first half on 30th June and the second half on 30th September, to replenish the stores kept at the depôt.

As well as the usual issues of clothing to soldiers, cloth, serge, lace, and clothing materials can be got from Pimlico by “special claim” for the use of the troops on immediate payment according to price list.

**Clothing of Men about to Leave the Service.**—Men whose services with the colours expire between the 1st April and 30th September following, or who have given notice that they will claim their discharge between those dates, receive no fresh issue of clothing, neither are October boots given to men who are similarly leaving between the 1st October and 31st December. Soldiers so circumstanced, if necessary, may get an issue of part worn clothing from store, on an application being made to the Director of Clothing. These men cannot claim compensation.

**Receiving Clothing into Store.**—As soon as any consignment of clothing or necessities arrives, the packages should be counted and examined, in order to see whether they have been tampered with or damaged by wet or otherwise; before any receipt is given to the carrier, any deficiency, damage, or sign of tampering appearing on any of the packages should be recorded on the carrier's note. These precautions apply to the taking in of all stores. The carrier should be informed when the packages will be opened, so that he may have an opportunity of being present.

**Board of Survey.**—As soon as possible after the receipt of new clothing the P.M.O. should assemble a Board of Survey, in the presence of which the packages are counted, weighed, opened, unpacked, and the contents carefully examined and checked over with packing-note or invoice.

In regiments the Board tests the size of ready-made clothing by trying on 10 per cent. of them on men of corresponding sizes.

The proceedings of the Board, in which should be recorded any damage, deficiency, discrepancy, or defects in pattern or workmanship, should be made out on A.F. H 1156, and sent in duplicate by the P.M.O. to the Director of Clothing; at the same time he should sign the receipt voucher for the consignment.

A triplicate copy of the proceedings of the Board should be kept in "Records of Boards of Survey on Clothing," A.B. 106, as an office record.

If any articles are found damaged or unfit for issue the Board can reject them, although they cannot finally condemn them; yet an opinion may be recorded that they ought to be condemned.

In such a case the P.M.O. sends an extract of this opinion on A.F. H 1154 with his remarks to the G.O.C., who may overrule the opinion, but if he agrees he sends on the extract with his remarks to the A.G., War Office.

In the case of boots being objected to, the maker's name, which is stamped on each pair, should be mentioned in the proceedings of the Board and extract.

**Annual and Transfer Clothing Documents.**—On the 31st March each year, or on the transfer of stores from one C.O. to another:—

1. The clothing accounts A.B. 287 for detachment of over 250 men, or A.B. 288 for a less number.
2. The new clothing ledger A.B. 274.
3. The part-worn clothing ledger A.B. 276 and
4. The ledger for necessities, A.B. 277, should be balanced, and a Board of Survey assembled to verify the remainings in store of
  1. New and part-worn clothing on A.F. H 1166, and
  2. Necessaries on A.F. H 1165.

Office copies of the proceedings being kept in A.B. 106.

Similarly all necessaries and sea kits in store are examined with the same object quarterly—on 31st March, 30th June, 30th September, and 31st December.

**Part-worn Clothing.**—From soldiers becoming non-effective through any cause, or on promotion, articles of clothing are returned into store before they have served the term allotted by regulation; such clothing are called “Part-worn clothing or necessaries.”

The following is the method of computing the value of lost articles:—

Deduct the worn-out value of the lost garment from its value when new, divide the remainder by the number of months the garment should wear, multiply the quotient by the number of months the lost garment has actually been worn, subtract the result from the total value of the garment when new, the remainder will be the amount to be charged.

This description of clothing may be sold to men to replace deficiencies, or who may require them, on payment at fixed rates.

Part-worn clothing in excess of what is required in a division, if serviceable, will be forwarded at the end of each quarter to the 16th Depôt Division, Aldershot.

**Time-expired Clothing.**—Clothing which is time expired, is returned into store by the men; it is *customary* in the M.S.C. for the district Q.M. to sign the soldier's pocket ledger in acknowledgment of the “withdrawal.” Issues are signed for by the soldier and his C.O. These ledgers ought to be balanced on 31st March, or as soon after as the issues are made, and signed.

The C.O. applies annually for instructions as to how he is to be relieved of this time-expired clothing; generally it is handed over to the Ordnance Store Department before being sold, unless torn up; the condemned mark is placed upon every article; a few articles, 10 per cent., may be retained by authority for repairs of other clothing.

Although soldiers are permitted to retain their old clothing, it must be finally returned to store in such a condition as would show that it has only undergone fair wear and tear, otherwise a soldier is liable to be charged for mending or making good any article. There is a value fixed on this clothing, which will be charged in case any article is not returned into store; the rate of charges is published in A.O.

**Compensation in lieu of Issue.**—Compensation may be given instead of an annual issue of clothing to a soldier as a reward, if his C.O. is satisfied on the 31st March that the clothing in his possession is fit for use for the whole of the ensuing year. On application, the G.O.C. sanctions the withholding of the annual issue of clothing, and authorises the man being credited with compensation money.

For compensation to be granted, it is necessary that all articles of clothing be fit for wear for the whole year. For instance, if



a soldier's trousers are considered unfit to last, no compensation can be claimed, although his tunic may be as good as new; but boots can be issued in kind and compensation allowed for all other articles, or compensation may be allowed in lieu of boots not issued. Also compensation may be allowed to warrant officers and staff-sergeants for forage caps.

The district Q.M. will prepare, on receipt of proper authority, A.F. P 1917, for compensation due to individuals.

**Issues.**—The district Q.M. should issue to officers commanding detachments, as soon as possible after the 1st April in each year, the new clothing due to the men; A.F. H 1116 will be used for this service. When signed by each man in acknowledgment of having received his clothes, the form will be returned to the O.C. the division.

**Marking.**—Clothing as a rule is marked at the public expense at the time of issue, but a soldier pays for marking articles purchased from store. The first issue of equipment is made in sets, each article having the same number. For the recovery of sums for marking either new or time-expired clothing, the district Q.M. prepares A.F. P 1962, and after obtaining the signature of the P.M.O. to this, he gets the authority of the Director of Clothing to charge the amount in his pay list. On receipt of authority the marker is paid, and the form, etc., attached to the pay list as a voucher.

Clothing is marked before issue in the following manner:—Corps mark M.S.C., regimental number, and the date thus —4-88. When part-worn clothing is issued it is re-marked, the original number and date having lines stamped, branded, or stencilled over them; still the old figures should remain legible.

Necessaries are marked and numbered, but not dated as to time of issue.

The condemned mark is two broad arrows with their points directly opposed.

The district Q.M., on men being discharged or transferred to the army reserve, will issue a suit of plain clothes to them, or, if they have provided themselves with plain clothes, an allowance in lieu, which will be recovered from the public on A.F. H 1147, after pre-audit by the station paymaster.

**Books, Regimental Records, Extension of Service, and Transfer to Medical Staff Corps.**—A M.O. handing over command of the M.S.C. will certify to the P.M.O. that the detachment books and personal documents of the men have been transferred to the officer taking over the command, and also that the kits, arms, and accoutrements are complete or otherwise.

Lists of these books and documents may be found in the Q.R. and M.R.

**Attestation Paper.**—The duplicate attestation, which is in charge of the man's immediate C.O., of re-engaged men serving

at home will be sent yearly, in January, to the officer in charge of the attestations at head quarters, who, on checking the entries on the 3rd and 4th pages of the duplicate with the original attestation, will return the duplicate with any remarks necessary. A certified copy of the 3rd and 4th pages of the duplicate attestation of re-engaged men serving abroad will be sent home in January, and in like manner compared with the originals.

*The first page* of an attestation records the proceedings on attestation, such as the questions put to a recruit before enlistment, his declaration or attestation, and the oath of allegiance taken by him; also the certificate of the magistrate or attesting officer, that is, a military officer exercising powers similar to a justice of the peace in this respect.

*The second page* gives a description of the soldier on enlistment, distinctive marks, etc., as well as the certificate signed by the approving M.O. and approving field officer. The approving M.O., as approving officer, must here certify that the man is suitable for the M.S.C.

*The third page*, Record of Service, contains a statement of the soldier's services, periods of service in each rank, promotions, reductions, casualties, good conduct pay, grade of orderly, etc.

New forms of record of service for men enlisted since 1st June 1888 have been issued, with specimen sheets showing how entries are to be made, and also instructions as to the manner of closing the old forms whenever further records are necessary with respect to the services of other soldiers.

*The fourth page*, or Military History Sheet. Herein are shown the number of years and days spent at home and abroad, as well as campaigns, wounds, medals, decorations, and annuities, certificates of education, whether cook, compounder, lunatic attendant, and the name and address of next-of-kin, etc. When a man is in possession of a medal or decoration, accompanied by an annuity, an entry as to the annuity is to be made under the head of medals and decorations; gratuities are not here recorded. All entries on the military history sheet "are to be made from time to time as they occur, and initialed by the officer making the entry."

"Foreign service is reckoned from the date of quitting the United Kingdom to the date of returning to it; service in India is reckoned from the date of embarkation in England, or a colony, for India, to the date of disembarkation on return from India, or if taken on payment at the Royal Victoria Hospital, Netley, to the date of leaving that establishment, inclusive."—*Q.R.*

**Approving Medical Officer.**—The legal principle involved in a certificate is further exemplified in the approval of a recruit before he is finally passed into the service. As approval may be taken to mean the power to sanction by administrative authority, no officer is invested with this power unless he be at the time

himself subject to military law; consequently, if acting as a civilian, he cannot finally pass a man into the service. The R.P. state that they "shall apply to a person subject to military law," and that "nothing in these rules shall confer on any person not an officer or soldier any jurisdiction or power as an officer or soldier." See definition of approving M.O. in the M.R.

The approving M.O. fills in the medical history sheet of the man on joining.

**Extension of Service, Re-engagement.**—The following are some of the conditions upon which warrant officers, N.C.Os., and soldiers are permitted to re-engage, in accordance with sec. 84, A.A., 1881, to complete a period of 21 years army service. This period will be reckoned from the date of attestation, and will include any period served in the reserve forces. Warrant officers and sergeants *have a right* to re-engage after they have completed nine years army service if medically fit, and if considered unfit to re-engage, a medical board *will* decide whether such is the case. Other soldiers, in doubtful cases, *may be allowed* to appear before a medical board, with a view to a decision being arrived at as to their fitness or unfitness to re-engage. The G.O.C. is the competent military authority to carry out their re-engagement. The Secretary of State for War can veto any re-engagement. Corporals *may be allowed* to re-engage at any time after they have completed 9 years army service; other soldiers at any time after they have completed 11 years service if in possession of *two* G.C. badges, or men of good character specially recommended by their C.O., subject to the approval of the A.G.

C.Os., when submitting applications for re-engagement, will forward A.F. O 1724, duly signed by the soldier and by the C.O., and a copy of the man's record of service. Declarations on re-engagement are not to be prepared in duplicate. The original re-engagement paper should be attached to and preserved with the attestation. "N.C.Os. and men who decline to re-engage while serving abroad, and who are sent home in consequence, are not to be permitted to re-engage on arrival in this country," but men over eight years on foreign service may be sent home on re-engagement. "When a soldier serving with one corps is eligible to re-engage, and desires to re-engage into another corps, an application for transfer for the purpose of re-engaging should be made. The re-engagement should be carried out previous to the transfer."

"All applications for warrant officers, N.C.Os., and men of the M.S.C., whether at home or abroad, to extend their service, re-engage, continue in the service beyond 21 years, or be transferred to other corps, will in the first instance be submitted for the sanction of the D.G."

**Applications by Soldiers to Serve in the Medical Staff Corps.**—Officers commanding battalions at home, or the dépôts

of regiments serving abroad, furnish annually to the A.G. nominal and descriptive returns, A.F. B 242, of men who are desirous of being transferred; copies of company defaulter sheets are appended to the return.

**Qualification.**—The qualifications required from the men who may volunteer are as follows:—

- (a.) They must be men enlisted for short service, and have served at least one year.
- (b.) They must be unmarried, under 30 years of age, able to read and write, and not less than 34 inches round the chest; height the same as for recruits.

**Care in Selecting Candidates.**—"In selecting men, C.Os. are to bear in mind that only the names of candidates should be submitted whose good conduct and steady behaviour afford a promise that the responsible duties with which they must frequently be entrusted will be satisfactorily performed, as great expense is frequently incurred through men who are not properly qualified being recommended."—*Q.R.*

**The Period of Probation** is three months. N.C.Os. volunteering must relinquish their rank before they can be allowed to join the corps on probation, and they can only be finally transferred as privates. During the period of probation the candidates will be retained on the strength of their corps. At the expiration of the probation application will be made by the O.C. the detachment of the corps to the staff officer of the corps for the confirmation of the transfer, should the men be found eligible.

**Transfer to Medical Staff Corps.**—The personal documents will accompany a man transferred on probation; these are his defaulter sheets, returns of clothing, necessaries, etc. On final transfer all other documents will be passed through the P.M.O. to the D.G. N.C.Os. and men of the corps serving at home who are unfitted for their duties, may, on the fact being represented by the D.G. to the A.G., be discharged in consequence of being unfitted for the duties of the M.S.C.

**Discharge.**—If a N.C.O. or man serving abroad be inefficient, he may, on the representation of the P.M.O., be dealt with under the authority of the G.O.C. in such manner as he may think fit. When the man is sent home the proceedings on discharge, accompanied with the necessary documents, should be sent with him for confirmation by the G.O.C. at the port of disembarkation. Should the man be permitted to remain abroad his discharge is carried out at once. Applications for discharge of men serving at home on account of inefficiency will be submitted on A.F. B. 130 through the P.M.O.

Applications for the discharge of soldiers of the M.S.C. for any other cause than inefficiency will be authorised as laid down for other soldiers.



When it is necessary to obtain the attestation of a soldier serving at home whom it is proposed to discharge, the P.M.O. will forward, for transmission to head-quarters, the duplicate attestation, which will be returned with the original. Special instructions for recording a man's service, character, conduct, proceedings on discharge, and entries to be made on parchment discharge certificate, will be found in Q.R., also the rules for discharge of invalids and insane soldiers.

## CHAPTER VII.

## AIR, WATER, VENTILATION, AND THE CONSTRUCTION OF BARRACKS.

The Rev. Samuel Haughton, M.D., in his address before the British Medical Association in 1887, referring to the natural rights of man, said :—

“The natural rights of every human being born into the world may be shortly summed up as follows : liberty, air, water, food, heat, and light. The most important of these are air, water, and food. Without air, we live three minutes ; without water, we live three days ; without food, we live three weeks. Instincts, stronger than reason, compel us from our birth to seek these natural rights for ourselves ; by force, if necessary ; but how slow has been our progress in recognising the equal claims of others to the enjoyment of these natural rights.”

I shall now refer to these three principal elements of natural rights, namely, air, water and food, with special reference to the regulations which govern their issue to the soldier.

The soldier on enlistment engages to serve his Sovereign for a fixed term of years. In the proceedings on enlistment there is no contract or agreement entered into that, in return for his services, he will receive a free ration of either air, water, or food, or that he will be provided with lodging, fuel and light, or a bed to lie on ; in fact, through the exigencies of the service he may have to lie upon his mother earth, and this is a natural right of which no son of the soil should be deprived.

In subsequent pages of this Manual frequent references will be made to the writings of Edmond Parkes, whose memory has the greatest claim on the gratitude and respect of the British soldier, by being instrumental in securing to him, through an honest, zealous, and thoughtful advocacy, a liberal measure of those natural rights we are considering.

In the housing of troops the supply of air is a matter of primary importance. Although the problem of ventilation is an engineering one in connection with the design and construction of habitations, still there is a medical question involved in it. Officers of the M.S. are frequently called upon to express opinions as to the state of the ventilation of buildings, either proposed for occupation or in actual occupation by troops. Under the varying circumstances or conditions in which the men may be placed, during peace or war, this is a responsible duty, and professional, by reason of the physiological facts on which the principles of

ventilation are established. M.Os. can nowhere disassociate themselves from responsibilities in matters relating to ventilation, as it is intimately connected with sanitary science and a most important factor in the preservation of health.

Air and water may be regarded as food, but the term food is generally and legally restricted to alimentary substances capable of oxidation, or those which direct or regulate nutrition. At the same time it is air which supplies the oxygen necessary for the carrying on of every vital action and the production of energy. In a living body rest is impossible—"all manifestations of life are due to the action of food, and the derivatives from it and air upon each other."

When oxidation, excretion, exhalation, and evaporation compensate each other in a reciprocal and natural manner, the temperature of the body should remain within a defined and limited range; hence this temperature has been adopted as the best objective standard of health. On the other hand, without unduly straining the compensatory power of the body, and in order to sustain it in a normal state, certain conditions of the atmosphere are necessary. This standard healthy state of the atmosphere is judged by the absence of impurities rather than by its own inherent qualities. However, both conditions must be taken into account, and the general condition judged by the practical test of habitation. Some houses or ships, through unforeseen causes, retain the air within them in a condition more conducive to health than others; and the same as occurs in confined spaces with their artificially manufactured atmospheres is found to be the case with respect to climates connected with localities or regions of the earth. For convenience certain artificial standards have been fixed upon whereby to judge of the best or most pleasant atmospheric condition, yet it remains the province of medicine to draw deductions from chemical facts, or others established by experiments, or through the physical sciences.

In nature force is the cause of the phenomena which are the manifestations of its actions. Its "law" relates to the uniform action of these forces, and states what they will do in a given case. This, the universal law to which we are now about to refer, is not formulated by the legislature. Offences against nature's laws do not admit of the sentence being revoked or a commutation of punishment; punishment will follow in relation to the transgression as cause and effect. It is the object of medical and sanitary science to remove or otherwise prevent as far as possible the causes which induce ill-health, to mitigate their evil consequences, to prolong life, and add to its enjoyment. By aiding and abetting those natural occurrences which are most to be desired, a restoration of health may be hastened and practically effected without the body bearing any perceptible trace of a previous injury or disease; but a "perfect cure," a cure absolutely without any

impression remaining as the result of injury or disease, or an offence against nature's law, is not to be expected.

We shall see that the conditions to which men are necessarily subjected during war are opposed to the laws which govern health—they are, over-crowding, excessive labour, want of rest, undue exposure and defective food. These adverse conditions are proportionably intensified according to the proximity and active hostility of the enemy; they are the chief things which make war so destructive to health and life. No matter how well organized and disciplined an army may be, it is virtually a crowd; and no matter how systematically war is conducted, over-crowding in camp, bivouac, and on the line of march is a state inseparably connected with its operations; consequently the price to pay for this over-crowding must be reckoned among the expenses connected with war.

The Rev. Dr. Haughton, who has contributed so largely towards the advancement of medical science, states how sudden is the death of a person when deprived of air. This is an absolute deprivation, but a limitation of the supply will be followed by the same result, the fatal issue alone being deferred. It has been proved beyond all reasonable doubt that by limiting the supply of air to persons living within a confined space their health is thereby injuriously affected, and this is chiefly manifested in an increased prevalence of diseases of the respiratory organs; further, whenever air is re-breathed it is a potent cause of pulmonary consumption. So the cutting-off of air from the lungs altogether, and the undue restriction of its supply, are cognate offences against nature's laws; they are of the same nature and lead to the same result.

As in the case of air, so it is with respect to water. There are certain artificial standards set up as the limitation of its impurities, which, if exceeded, health will manifestly and almost immediately be thereby affected. The chemical or physical standard by which to judge of the wholesome or unwholesome nature of water is more or less conventional. Thus the term "usable" is in reality no more than saying that the majority of people can drink it, not with impunity, but without showing any direct ill-effects from its use. It by no means follows that within the fixed standards of purity of either air or water, that some persons, through idiosyncrasy or other causes, will not be injuriously affected; on the other hand, both air and water may be very impure, and yet their use may not be followed by any striking effect on any individual; and the same may be said with respect to food.

Food as we use it is not a natural element; it is practically a combination of artificially prepared compounds. From the directly injurious effects of some of its ingredients we are protected in the United Kingdom by a statute of limitation, known as the Adulteration of Food and Drugs Act.



In stating the action of air, water, or food on the system, we are rather liable to draw the distinction of cause and effect too closely, for in reality the effect may be but the continuation of the original cause manifesting itself more distinctly, never clearly defined, and still wrapped in obscurity. When the effect of any cause is remote, it is extremely difficult to clearly establish the connection. The minor and more insidious influences in operation under cover of earth, air, water and food, both by reason of their character and the palpable indifference with which they are treated, will ultimately prove the most destructive; they will not strike at individuals specially, neither will they arouse the public to a true sense of danger by the virulence of their attack, but they will gradually, by a sap and mine process, depopulate a district or degenerate a race.

Beaconsfield truly said—"The fate of a nation will ultimately depend upon the strength and health of the population. Both France and England should look to this: they have cause."

**Composition of the Atmosphere.**—In 1,000 volumes of air there are—oxygen 209·6, nitrogen 790, carbonic acid 0·4, ammonia about one part in a million.

This trace of *ammonia* exists generally as a salt,—carbonate, chloride, nitrate, or nitrite. It is evolved during the decomposition of nitrogenised substances, and is absorbed by moisture in the atmosphere, from which it is frequently removed by the fall of rain. There is also a trace of organic and mineral matters in air; ozone exists in pure free air. The atmosphere contains a varying amount of watery vapour, from 60 to 70 per cent. Taking 100 as saturation, if not within these limits the air is either unpleasantly dry or moist. Supposing 61° Fahr. to be the standard temperature for England, the difference of temperature between the dry and wet bulb thermometer should not be less than 4° or more than 8°; watery vapour ought not to exceed 4·7 grains per cubic foot at 63°, or, say, 5 grains at 65° Fahr.

**Carbonic Acid** occurs as the result of combustion, respiration, and decomposition, consequently the amount in the air will deviate from the above standard. The quantity in the air over land is found to be greatest during the night, probably on account of the amount evolved by vegetation during that time; like oxygen, it also varies according to the different seasons of the year, the greatest quantity being evolved during the month of October. The carbonic acid resulting from combustion and other sources in towns is readily diffused and removed. Carbonic acid in air, due to the destruction of organic matter, is generally associated with salts of ammonia, the result of the decomposition of nitrogenised matter.

**Ozone** is condensed oxygen or gas in a very active form. By oxidation it renders harmless noxious products, and is a powerful deodorant. The presence of ozone is indicative of the absence of oxidizable organic matter in air.

**Nitrogen.**—The properties of nitrogen are negative; its utility in the atmosphere is to dilute it; probably it also exercises some influences in equalising the distribution of heat over the earth. Nitrogen in its free state is not absorbed by either animals or plants. How vastly different is the position assigned to nitrogen in the animal and vegetable kingdoms. It is essentially the basis of all structures possessing living properties. Wherever living changes of any description take place, nitrogen must be present and participate in the action, hence it has been called the “mainspring of life.” It is on the presence or absence of nitrogenous organic matter that the good or bad qualities of air and water will mainly depend.

**Physical State of the Air.**—The atmosphere is a mixture and not a chemical compound of its constituent gases. Two among many experiments which prove this may be mentioned, as they are of some practical utility with respect to the aëration of distilled water and the employment of nitrous acid gas as an air purifier:—

1. When air is shaken up with water it is not dissolved as a whole, but the nitrogen and oxygen are dissolved in proportion to their ordinary solubility. Had the air been a chemical compound, it would be impossible to decompose it by simply shaking it up with water, and the water on being boiled would give off the air in its original proportion of nitrogen and oxygen, namely, as one to four; but when thus driven off, the proportion of oxygen is increased, owing to its greater solubility in water than nitrogen.

2. The atmosphere when brought into contact with nitrogen dioxide parts with its oxygen, forming nitrogen tetroxide or nitrous acid. The facility with which this latter gas parts with the oxygen obtained from the air renders it an active agent in the oxidation of organic matter, especially so as its action is continuous.

The great purifying agents in air are ozone, peroxide of nitrogen, and nitrous acid; rain is recognised as being the great air-washer. The property of air to purify itself, or tendency to part with what does not necessarily belong to it as a natural right, is a principle of wide application in the universe; it is also observed in water and earth. Wherever there exists no absolute property right in a thing, there is a disposition manifested throughout nature to a restoration of equilibrium.

**Weight of the Air.**—By weight, 100 parts of air contain 23 oxygen and 77 nitrogen. The pressure or weight of the air on an average at sea level is 15lbs. on every square inch; an ascent of 900 ft. takes off  $\frac{1}{2}$  lb. This rarefaction or lessened pressure of air varies with height; at about 3,000 ft., which represents a descent of, say, three inches of mercury, the temperature is lowered, there is lessened moisture, and greater circulation of air. Owing to rarefaction, when clouds are absent the soil is

rapidly heated, but radiates quickly where there is no vapour in the atmosphere to hinder it, hence the marked cooling of the ground and the air close to it after sunset at high altitudes.

The deficiency of oxygen in a rarefied atmosphere is compensated for by the increased activity of the respiratory and circulatory organs. On the other hand, compressed air, while it diminishes the number of respirations, prolongs the act, and increases the capacity of the lungs.

The treatment of pulmonary affections by air compressed from one to ten atmospheres, or rarefied according to the requirements of the case, as a substitute for change of climate, has been introduced in America, while rarefied mountain air is beneficial in anæmia, from whatever cause arising. Compressed air is said to be a useful remedy in bronchitis and asthma.

**Climates** are classified according to their temperature, irrespective of moisture, rarefaction, electrical, or other atmospheric conditions. The variations of a climate, as well as being due to its geographical position, are greatly influenced by the relative amount of land and water; also ocean currents and local conditions, such as the nature of the soil, its elevation, aspect, etc.

Equitable or limited climates are usually insular, with but little annual or diurnal variations.

Extreme or excessive climates with great variations are continental.

The difference between the maximum and minimum temperatures in the shade gives the most important climatic indications.

The physiological effects of heat will depend upon its nature, whether non-radiant from the air, or radiant from the direct rays of the sun, or from artificial sources.

The average range of temperature between day and night at Greenwich is about  $16^{\circ}$  Fahr. This varies; in December the difference is only  $8^{\circ}$ , while from May to September it might be  $20^{\circ}$ . In extreme climates the variation may be as much as  $70^{\circ}$  in the 24 hours, or even more, as in Central Australia.

The sun's rays passing through the air with but trifling loss fall on land or on water. The specific heat of land being only one-quarter that of water, it both absorbs heat and gives it out more rapidly. Water, on the other hand, absorbs it more slowly, stores up a greater quantity, and parts with it less readily.

The temperature of the superficial water, even in the hottest regions, seldom exceeds  $80^{\circ}$  to  $82^{\circ}$ , and that of the air is generally below ( $2^{\circ}$  to even  $6^{\circ}$ ) the temperature of the water (*J. Davy*). Consequently the more land the greater is the heat, and the wider the diurnal and yearly amplitudes of fluctuation. The kind of soil has a great effect on absorption, and the land also transmutes the heat to a certain extent (*Parkes*). The evaporation from the water also greatly cools the air. I found the temperature of the sea water at Suakin during the summer was  $92^{\circ}$  Fahr. Ether

remains in a state of vapour at 96° Fahr.; consequently when the ether used in the ice machines evaporated, there was no means of condensing it again to continue the process, thus the machine employed proved a failure.

Suakin, that Brighton of the Red Sea littoral, is within the "climatic poles of heat." The temperature here is generally highest from the end of July until the beginning of September. On the 20th of August 1884 the thermometer registered 125° Fahr. in the shade, the mean temperature during this month being 116°10. Only on two days did the thermometer go below a hundred, and on both days it stood at 99°; on six days the thermometer was 120° Fahr. in the shade. This register of the thermometer varies but little from what was observed during the following year, 1885, except that the greatest heat was experienced early in the month of August, when the thermometer stood for some days as high as 126° Fahr. in the shade.

**Mountain Air.**—It has been stated that there is a greater amount of carbonic acid in the air about the summit of mountains than at their base. It occurs to me that, independently of volcanic action, this may be owing to the varying pressure of the atmosphere at different levels, and also to the action of winds. The atmospheric pressure or resistance at the top of a mountain is less than that at any lower level, hence the effect of pressure against the mountain's sides is to force the subsoil air in the direction of least resistance, namely, towards the summit; the crusted and hardened condition of the mountain sides forming as it were a funnel, contribute to this result. Considering the relation that exists between the state of the ground air and the occurrence of diarrhœa in districts, the connection should not be overlooked in matters relating to mountain hygiene; the want of salubrity and the prevalence of so-called hill diarrhœa in many stations in the Himalayas may be accounted for in the above manner.

**Respiration** is the process by which oxygen is introduced into the system and carbonic acid and superfluous water discharged; through the lungs this oxidation is effected and excretion takes place. Air is introduced into the lungs through the bronchial tubes in which the trachea ends or divides, one for each lung; these tubes continue to bifurcate or sub-divide as they progress, and by so doing produce many thousand tubes; these minute tubes ultimately end in expansions or so-called globular passages, from the sides of which the air cells project. The cells, like little sacks, bulge into the expansion at the end of the tube, and thus give it a globular appearance; the cells are not arranged as it were on a stem like a bunch of grapes; they are held together by the lung tissue. The partitions between the cells are so extremely thin as to allow the capillaries to project so far in between them as to admit of the blood which they carry being almost completely surrounded by the air to which it is here



exposed. It has been estimated that as much as 3,500 tons of blood is oxidised annually in a man.

If oxidation was extensively carried on in the lungs, the heat due to chemical action would be too great, but it is here the oxygen is absorbed by the red cells of the blood, to be finally distributed by the circulatory organs, as required. Wherever a muscle or gland is in action, an increased supply of blood is sent; in fact, wherever work is going on oxygen is necessary; carbonic acid, due to chemical action, the result of work, is conveyed through the veins to the lungs and cast off. Oxygen is thus withdrawn from the atmosphere and replaced by an equivalent of carbonic acid, and food is required to supply oxidisable substances, and thus prevent the waste of the tissues which would otherwise occur.

There are about 1,700 cells connected with the termination of each bronchial tube, or 600 millions in both lungs. Owing to this number of cells, the surface of the lungs exposed to the air has been estimated as equal to 1,400 square feet. From such anatomical and physiological conditions it is easy to understand the deleterious influences exposure to an impure atmosphere is likely to exercise, and the necessity for an ample supply of fresh air.

A man breathes from 16 to 18 times in a minute, and about 20 cubic inches is admitted at each inspiration. If shut up in an enclosed place he injures the purity of the atmosphere in those matters which act most injuriously on his own health.

**Carbonic Acid of Respiration.**—The amount of oxygen abstracted from the air averages a little more than the carbonic acid exhaled. It varies according to size or weight of the individual and the amount of food or exercise taken. Climatic conditions also influence it, more being evolved in a cold moist atmosphere than in a hot and dry one. On an average 100 parts of respired air will contain only 13 instead of 21 parts of oxygen, 8 parts being abstracted by the blood corpuscles in the lungs. Pettenkofer ascertained that a person who evolved .56 cubic feet of carbonic acid per hour during repose, while actively employed gave out 1.5 cubic feet per hour; a man at moderate work exhaled in the day time 0.78 cubic feet per hour; .6 cubic feet of carbonic acid per hour is generally adopted as the "standard average quantity."

From these estimates it might occur to one that dormitories would require less individual air space than day rooms, but during sleep the system is most susceptible to the action of any unhealthy atmospheric condition. A barrack-room is used as a day-room, dining-room and dormitory.

It has also been ascertained that a man who at light work evolved 0.006 cubic feet of carbonic acid per pound weight of his body, while at hard work doubled this amount. This shows the necessity for introducing a larger quantity of air into workshops, gymnasiums, etc., and furthermore the necessity for a workman to be supplied with oxidisable substances, as food, sufficient in

quantity to meet this evolution of carbonic gas which results from the force expended by him, otherwise his own tissues will be used up in supplying material. The amount of carbonic acid passed off from the system is now regarded as an index of work performed. It is also a standard measure or index of the extent to which the atmosphere is contaminated by either man or animals, although not of itself the chief cause of impurity.

We see the atmosphere contains .04 per 100 or .4 per 1,000 volumes of carbonic acid. Where .2 more volumes per 1,000 are added by respiration, we arrive at .6, or the stated "maximum amount of respiratory impurity admissible in a properly ventilated space." From the amount of organic matter contained in such an atmosphere it is generally perceptibly impure to the sense of smell—a natural and practical test for such impurity. Thus we see .6 is connected with two standards, which in their relation to ventilation it is necessary to bear in mind.

To so dilute the .2 volumes of carbonic acid of respiration as to retain the air in its normal state (.4 per 1,000), it is reckoned that after the air in a space has been exhausted of its purifying properties, 3,000 cubic feet of air per head per hour should be passed through the apartment. Parkes estimated that 3,600 cubic feet of air, irrespective of space per head, per hour are required to keep an atmosphere in a state of purity, just *one cubic foot per second*. Thus 600 cubic feet of space would require a change five times in the hour; but so rapid a change could not be borne in a cold climate on account of the draught:  $600 \times 5 = 3,000$ . The smaller the cubic space the more frequently must air be passed through in order to keep it in a state of purity; if the interchange exceeds three times in the hour, an unpleasant draught will be created. In order to guard against draughts, with due regard to the expenses of construction and other considerations in connection with the subject of ventilation, while dealing with it in a practical way, the Commission on Barracks, 1861, recommended the adoption of 600 cubic feet, previously proposed by the Sanitary Committee as the unit of space for each soldier, and that the air in this space should be renewed twice in the hour—that is to say, 1,200 cubic feet of fresh air should be supplied per hour, and that half of this should be warmed before entering the room. This recommendation has been adopted in the service, and it behoves all concerned, especially C.Os., to see that their men get their full regulation allowance of barrack-room accommodation and interchange of air.

No false economy in construction of buildings should limit this authorised supply. From the report now before me, it is proved beyond doubt that being deprived of air meant being deprived of health, and that want of air and waste in the ranks, chiefly from lung affections and zymotic disease, co-existed. In the United Kingdom collectively it was found in 1861 the

deficiency in space amounted to 32 per cent. on the unit of 600 cubic feet. Chatham barracks showed the greatest deficiency, amounting to 43·4 per cent. per head, with an equivalent of sickness and mortality.

**Carbonic Acid and Gases of Combustion.**—The gases generated by the combustion of coal are carbonic acid and carbonic oxide, carburetted hydrogen, both light and heavy, and sulphurous acid. Carbonic oxide is without smell and most poisonous; sulphurous acid has a bad smell and is very injurious to plants; the carburetted hydrogens are harmless. Carbonic acid, when mixed with air and absorbed into the blood, is poisonous; when the quantity is excessive, to the exclusion of air, it asphyxiates.

Air rendered impure by the products of combustion by no means exercises the same injurious influences on health as is the case when it is contaminated by the products of an analogous process which takes place within the body, and is indicated by the carbonic acid exhaled. The gas burners ordinarily employed in barracks and hospitals consume 3 cubic feet of gas per hour. One cubic foot of gas when united with air produces 2 cubic feet of carbonic acid, and about 3 grains sulphur dioxide. Two of these burners, it is said, will destroy as much air as three men.

“The discomfort which we experience in badly ventilated rooms was formerly considered to be occasioned by the production of carbonic acid. We now know that it is caused mainly by organic matter, and that excess of carbonic acid can be borne without ill effects, if the air be free from deleterious gases and an excess of organic impurity. Still the amount of carbonic acid is, as a rule, a measure of other accompanying impurities in the air, for it is almost always found in bad company.”—*Fox*.

Although carbonic acid in the air is regarded as a poisonous gas, men are capable of performing work without any apparent inconvenience in an atmosphere in which it is excessive, as in soda-water manufactories, provided that they are supplied with an abundance of oxygen.

**Exhalation.**—The pores of the skin are the open endings of small tubes, about one-fourth of an inch long. Of these there are about 2,800 to the square inch. The number of square inches of surface in a man of ordinary size is about 2,500, hence the number of pores is 7,000,000, and the tubing with which they are connected is nearly 28 miles in length. A cold and damp condition of the atmosphere, by checking excretion from the body, tends to produce an unhealthy and febrile state. So in patients suffering from injuries where there is effete matter to be got rid of from the system, the fever arising under such circumstances is not necessarily due to septicæmia or any such specific cause according to the usual doctrines promulgated.

Moreover, such atmospheric qualities are likely to indirectly induce or aggravate fevers by favouring overcrowding and the withholding of a sufficient supply of air.

The quantity of water which escapes from the skin and lungs by the natural process of exhalation, and which goes to increase the humidity of the surrounding air, is not less than one ounce per head per hour, varying according to circumstances. On an average it is said to require over 200 cubic feet of air per hour to keep the water thus discharged in a state of vapour. The water from the lungs is partly derived from the blood by exhalation, and partly produced by the oxidation of hydrogen in food and the tissues; it holds suspended carbonic acid, ammonia, and organic matter.

In the moisture exhaled from the body there is a quantity of effete animal matter; this is the essence of its impurity, which, if retained in the system, would ultimately prove fatal. Owing to the conditions, adverse to health, to which soldiers are subjected while campaigning, it is probable that their bodies lose in a great measure the power of utilizing oxygen so as to get rid of all the effete products that should be eliminated. *See* p. 261.

**Moisture in the Atmosphere** is the vehicle by which poisonous exhalations are suspended or held in solution. After excretion animal impurities readily undergo putrefaction, and become deposited on furniture, bedding, floors, walls, and ceilings, which in time become saturated by such deposits. This excretion contains epithelium from the mucous and cutaneous surfaces of the body, and is composed of nitrogen and oxidisable matter,—it is a fostering agent and feeding-ground for the contagia of disease, notably for scarlet fever, diphtheria, puerperal fever, and erysipelas. Whenever present to any extent fevers are intensified; owing chiefly to defective sanitation in the dwellings of the lower classes, the fatality from scarlet fever is increased two-fold above what occurs in the houses of the wealthy. *See* p. 279.

Hot air charged with moisture is oppressive by reason of its checking evaporation. The spread of certain diseases is supposed to be intimately related to the humidity of the air; on the other hand, dry desert air, with suspended dust, renders non-effective particles of disease, disinfects and purifies the atmosphere, and so checks their spread.

The amount of moisture in the atmosphere will be affected by temperature; it should not register a greater difference between the wet and dry bulb thermometer of a hygrometer than from four to eight degrees; within this it is generally accepted that the best standard atmosphere for health will be found.

**Dew Point.**—The quantity of vapour which can be retained in an invisible form in the air will depend upon the temperature.



The *dew point* is the temperature when the atmosphere is so saturated with moisture that the least fall of temperature will cause the water it holds to be deposited as dew.

The spectroscope is employed for roughly estimating the watery vapour in the higher regions of air.

**Remarks on Ventilation.**—We have seen the quantity of air required to dilute the carbonic acid produced by exhalation down to the proportion in which the gas exists in the atmosphere, and also the amount of air required to dissolve the aqueous vapour escaping from the skin and lungs, but the average quantity of effete matter exhaled from the system, and which is the essence or basis of all impurity, has not yet been ascertained.

Purifying defiled air by means of disinfectants is operating on the same principle as purifying contaminated water by filtration. As a sanitary measure the most reliable and cheapest plan, when practicable, would be to obtain supplies from pure sources and prevent contamination.

It is a law of our organization that organic matter excreted from the body cannot be re-introduced into it without danger to health and life. The poison is exhaled from the body, and with the air it is again introduced through the lungs into the blood. Air retained in a chamber or confined space, stagnated, although chemically pure, is practically in a state unfit to sustain human life in a healthy, vigorous condition; so it is also in a measure with respect to food. Although chemically pure, when compressed and confined in a small space it is rendered somehow incapable of sustaining an individual in a normal condition of vital activity.

Apart from the physiological effects of either food or air, some analogy exists in these supplies as an issue to the soldier. There may be an abundance of food in the market, as there is oxygen in the atmosphere, and a fresh, sound ox may be driven to the slaughter, but by the time it is converted into beef and dished up it is often neither palatable nor digestible; and so it is likewise with his ration of air; although the supply is sufficient for consumption, it may be imperfectly distributed and presented in a very undesirable form—cold, damp, and comfortless.

The mode in which the necessary quantity of fresh air can be supplied "is an engineering problem, and there can be no doubt that in time to come it will be as carefully considered by engineers as the supply of water or the removal of the solid and fluid excreta. Ventilation is in fact the problem of the removal of the gasiform excreta of the lungs and skin."—*Parkes*.

This is the same statement as was made by the Commission, and although the main object involving the greatest difficulty may be the removal of exhaled matter, there remains also the

problem of supply and demand. The primary object of ventilation is to provide air to the lungs in a proper quantity and sufficiently pure to enable an individual to live in a normal healthy condition. A physiological as well as an engineering question is involved in this. The supply of water is as much an engineering question as the removal of waste water, but the quality, quantity, and necessary purity of either water or air are medical questions.

It is not enough to have air supplied chemically pure as regards its component parts, and in abundance as regards cubic space and superficial area; it must be fresh; it must not be too hot or cold, too dry or moist, neither must it be circulated with such velocity as to cause an unpleasant draught. The amount supplied should not be excessive. "A soldier no more than anyone else likes to have twice the quantity of air blowing on him in a crowded room than he would have if the inmates of the room were reduced to one half, and the remedy he usually adopts is that of closing all the ventilating openings within his reach." Where the room space is insufficient and the inlets few, the danger of leaving the ventilators under control of the occupants is increased.

Some barrack-rooms, owing to their ventilation being overdone and badly arranged, are miserably cold in winter. Air moving at a greater velocity than three feet per second, that is, two miles an hour, causes a draught, and in cold, moist climates it is unpleasant, if not positively injurious; but in warm climates a much stronger current can be maintained; and if this alone were to be considered in ventilation, less space would be required in a warm climate to keep the air practically pure, as a breeze might be passed through the room.

The following principles of action in operation as natural causes are taken advantage of in ventilation:—

*Perflation*, or the passage of a natural current of air through a room. *Aspiration*, or the abstraction of air from a shaft by the action of the wind blowing at right angles across its open extremity. This is employed as a means whereby to withdraw air from a room or confined space. *Propulsion* and *extraction* are means used for similar purposes in artificial systems of ventilation. Heat is primarily the motive power in all systems of ventilation.

The object aimed at in natural ventilation is to fulfil practically and efficiently the foregoing requirements at all seasons and conditions of the external air. The different and uncertain rates of pressure from winds are great obstacles in the way of regulating a system of natural ventilation; for instance, at a rate of three miles an hour the pressure is three-quarters of an ounce to the square foot, while at ten miles an hour it is half-a-pound. Ten miles an hour is the average annual movement of air in England.

It has been ascertained that if air within a room be 20° Fahr. warmer than the outside air, it will be expanded a twenty-fifth part more in bulk, and would be to that extent specifically lighter than the outside air. This cold air, if admitted near the floor, will press upwards the warm, expanded, and lighter air. To obviate this tendency it should be admitted so as to mingle with the warmer air and descend.

The diffusion of a gas is as the square root of its density. The diffusion of gases as a means of purification is defective, inso-much that it may not affect particulate organic substances in the air.

There is great difficulty in applying the diffusion of the various gases in the air as a means of ventilation. Thus, if a man were placed at the bottom of an open well or funnel he could not exist, as the air above would not be available for him. In the former edition of the Regulations and Instructions for Encampments (1883), it was stated as a point to be observed in the formation of a bivouac, "that it should be compact, the only spaces absolutely necessary being those required for communication," and it was noted, "There is no fear of want of ventilation with the sky for a roof, however close the men lie."

Now this conveyed a wrong impression; it implied that men can be packed as thickly as possible, provided they are left without a roof to cover them.

Staff officers have rough and ready rules for packing, by which "50 men may be packed in a house which in ordinary circumstances is inhabited by five, every barn, passage and stable being occupied."

Theoretically a space sufficiently roomy to admit of air for a man's consumption is all that is required; but by enclosing air within a confined space and rendering it stagnant, you practically deprive it of the property it possesses of purifying itself by diffusion, and this is especially the case if it is cut off from sunlight, which effectually causes air to circulate within itself. To render a room healthy the sun's rays should have access to it. Stagnant air, like stagnant water, is a genial condition for the development of those low forms of organisms which require rest for their increase. Thus air and water in order to retain their purity and restore to nature those elements which do not belong to them must circulate.

**Ventilation by Propulsion and Extraction.**—The essence of the system of propulsion is repletion of a room or confined space with air, which is left to escape by outlet shafts. The essence of the system of extraction is exhaustion of the air in a similar space, the place of the air removed being filled through inlets. In one case the motive power is at the inlet, in the other at the outlet.

When air shafts are employed in either of these systems they increase in sectional area in the aggregate on sub-division to-

wards the end remote from the motive power. The principle involved in this consideration is as old as Adam, as the sectional area of the tubing in his circulatory system was so arranged. The motive power in all systems of artificial ventilation is heat, whether a screw, fan, pump, hot-air pipes or steam be used; heat also exercises a great influence over all systems of natural ventilation. Artificial ventilation is employed on board ship, in most prisons and lunatic asylums, and in some large hospitals on the Continent; an artificial system of ventilation and an open fire-place are incompatible.

**Standard Atmosphere.**—Dr. Fox states—“The standard of pure air for our dwellings and for all places of public resort which we should endeavour to reach may be considered to be thus constituted:—

*Active Oxygen, Ozone, and other Air Purifiers* in recognisable quantities.

*Organic Matter, as Albuminoid Ammonia*, as near .08 milligram per cubic metre as possible.

*Carbonic Acid*, not more than .06 per cent.

*Temperature* to be determined by the sensations of the majority as to comfort.

*Moisture*, relative humidity, 70 to 75 per cent.; a difference between the dry and wet bulbs of about five or six degrees.

To approach this standard as closely as possible should be the aim of all who study the construction of healthy homes for the people.”

This is the standard of pure air which we should endeavour to retain within all confined spaces used as dwellings, including hospitals and troop decks on board transports and troopships. With respect to the temperature of the latter, Dr. Hunter, U.S. Navy, says—“The range of comfort in the extreme temperature is between 58° and 68° Fahr.” Parkes states the *standard temperature* of the air as 60°, other authorities a few degrees higher. The temperature for hospital wards may be taken at from 61° to 64° Fahr.”

**Density of Population and Law of Sub-division.**—The late Dr. Farr drew attention some years ago to the statistical law—“That the mean duration of life decreased as the proximity of one individual to another increased.”

Of necessity in the army and in civil life men must live in close proximity to one another, but to mitigate the evil consequences of this condition, and obviate as far as possible the necessity for separating individuals by surface extension, certain principles in the arrangement of buildings may be referred to. “The principle of sub-division is a fundamental law to be observed, as far as practicable, in all constructions intended for human habitation.” “The neglect of this law is one of the chief causes of the unhealthiness of large barracks, workhouses, hospitals, and other densely inhabited buildings”—(*Commission*



*Report*). Now the benefit of this "law of sub-division" is not obtained by merely sub-dividing men under one roof, where they are exposed to the same atmosphere. Each barrack-room must be kept independent of every other in respect of its ventilation, and so must the various confined spaces in ships required for the conveyance of troops. This principle of construction in connection with habitations is of wide acceptance, and when applied to a town has reference to the density of its population where it is found, in accordance with the statistical law referred to, that the death rate increases in a ratio according to the number of its inhabitants in a given area; yet it is always the poorer people who are overcrowded, and with properly constructed buildings and modern sanitary appliances there seems to be no reason why the number of inhabitants could not be increased within a given area to an extent which heretofore has been regarded as excessive population. Should this be the case, the so-called "law" can only be looked upon as a rule.

The area of occupied and unoccupied space covered by barrack buildings at home with two-storied buildings, allowing the usual intervals of twice the height of the buildings between each other, would be nearly 12 square yards per man. This is considered to be enough space for building on with good ventilation. Camps may be so compressed as to give only half this amount of space.

**Sites for New Buildings, how Selected.**—The following is the mode of procedure:—On land appropriated for their use, the C.R.E. will suggest a site to the G.O.C., who will order a board to assemble and report on the subject.

The board will consist of (1) the head of the department, the O.C. a regiment, or other responsible officer, who is to occupy the building when erected; (2) an officer not under the rank of captain; and (3) the C.R.E. or other engineer officer. A M.O. will be detailed to attend the board.

The general will refer the report of the board to the C.R.E. for his opinion. At home stations, on receiving back the report, it will be transmitted, with any comments the engineer officer may have to offer, to the Secretary of State for War for his decision. This shows the responsibility of the R.E. Dep. with respect to the site chosen for buildings, which, in all cases, are restricted to War Office lands. The regulations do not show that the Medical Department have any responsibility in connection with the appropriation of land for building purposes.

In the selection of a site for barracks the position must be determined on primarily for military purposes, but sanitary considerations should in a great measure influence choice of position. Barracks at home are, as a rule, built within towns, and not in their best quarters. The position of a station hospital must be considered in its relation to barracks.

Barrack, hospital, and departmental buildings, when completed by the R.E. Dep. and reported, on by a board of officers as

fit for occupation, will be taken over by the barrack department upon receipt of authority, and will be equipped as required for occupation.

This board will be a garrison board ordered by the G.O.C., "composed of a field officer, a captain, and an engineer officer. A M.O. is to attend to give evidence on sanitary points." If the buildings are stables or a riding-school the attendance of a M.O. is not necessary.

The M.R. direct that administrative M.Os. at their inspections of barracks "will note all sanitary defects in buildings and their surroundings, distinguishing whether such arise from (a) neglect of conservancy, (b) want of repair, (c) original structural defects. The two first can usually be dealt with locally, but the latter will be specially reported to the G.O.C."

Parkes says—"The opinion of Lind, whose large experience probably surpassed that of his contemporaries, and of our own time, should be remembered: 'The most healthy countries in the world contain spots of ground where strangers are subject to sickness. There is hardly to be found any large extent of continent, or even any island, that does not contain some places where Europeans may enjoy an uninterrupted state of health during all seasons of the year.'"

Romulus, the founder of Rome, according to Cicero, selected a healthy spot in a pestilential region. This although a good strategical position ultimately contributed towards the overthrow of his empire.

Continents may contain healthy spots, but for military reasons the troops may not be quartered in them. Military sanitation practically resolves itself into making the most of a situation, to deal with things as they are according to the necessities of the case, and to suggest the means of converting unhealthy places into healthy ones within the limits and restrictions imposed by military considerations.

It is a principle in the service that sanitary laws must be subservient to military requirements. However, it is admissible that, under certain conditions, sanitary considerations may be allowed to outweigh military ones. In the army the attaching of due importance to sanitary matters is progressing with the age.

**Subsoil, or Ground, Air, and Water.**—It is not within the scope of this work to deal with the subject of climate and the diseases connected therewith, or the conformation, vegetation, and constituents of the soil, beyond a few passing remarks. Moisture and ground water in a soil render it damp and cold, and are believed to produce rheumatism, neuralgia, catarrh, lung disease, bowel affections, and dysentery.

Enteric fever and cholera are supposed to be connected with the rise and fall of ground water. The air in soil may be a potent cause of disease by aiding the evolution of organic substances from ground having damp and filthy subsoil.

The rise and fall of ground water will influence the amount of subsoil air. When one is at its minimum the other is at its maximum. The state of the atmosphere affects both conditions.

“A moist soil influences greatly the development of the agent, whatever it may be, which causes the paroxysmal fevers. The factors which must be present to produce this agent are heat of soil (which must reach a certain point=isotherm of 65° Fahr. of summer air temperature), air, moisture, and some impurity of soil, which in all probability is of vegetable nature. The rise and fall of the ground water, by supplying the requisite degree of moisture, or, on the contrary, by making soil too moist or too dry, evidently plays a large part in producing or controlling periodical outbreaks of paroxysmal fevers in the so-called malarious countries. The development of malaria may be connected either with rise or with fall of the ground water. An impeded outflow which raises the level of the ground water has, in malarious soils, been productive of immense spread of paroxysmal fevers.”—*Parkes*. See p. 396.

An endeavour has been made to establish a causative relation between malarial diseases and the micro-organism named the bacillus malarix, but the evidence produced is not conclusive. As yet the question remains an open one.

The movement of subsoil or ground water is constant. It varies from 7 ft. to 15 ft. a day. The rate of movement depends on the compactness or looseness of the soil, or the inclination of the ground. The roots of trees also retard the movement. Its level is constantly changing, being influenced by the amount of rainfall. “Pressure of water from rivers or the sea, and alterations in outfall, either increase obstruction or the reverse.”

The most striking example of the ill-effects of the pressure of water from a river in this way I have known occurred in the Welsh regiment occupying the Kaser-el-Nil barracks, Cairo, during the summers of 1886-87. These barracks are situated close by the bank of the Nile, between it and the town, and each year they had to be abandoned after high Nile, the regiment being moved into camp at Abbassiyeh, in the desert, on account of the prevalence of a fever, recorded as simple continued fever. This fever was a nine-day fever, seemingly of faecal origin. Water and air pent up underground, while liable to be polluted by the soil and decomposition going on within it, are deprived of the means of purifying themselves. When sucked into houses, or forced into them by atmospheric or hydraulic pressure, they are very destructive to health. The present extensive irrigation works going on in Egypt may, by obstructing natural outlets and water-sheds, induce disease among the inhabitants.

When practicable the soil selected for building purposes should be a virgin soil. Made soils are generally to be avoided, although the organic matter in these soils will gradually dis-

appear by oxidation and removal by rain, subsoil water, and air. Cultivation and growing vegetation also aid the process of self-purification.

As regards the examination of a locality for military purposes, although meteorological observations, chemical examinations, and the science of medicine taken in the abstract have nothing to do with military considerations, an officer of the Medical Staff, in order to render the deductions drawn from his investigations practical, must be ever mindful of the requirements of the individuals for which they are carried on; as well as being a man of science, it is desirable that he should also have a knowledge and experience of the service.

**Habitations.**—In addition to the occurrence of disease due to general causes connected with locality, it may be induced by faulty habitations.

“The diseases arising from faulty habitations are in great measure, perhaps entirely, the diseases of impure air. The site may be in fault; and from a moist and malarious soil excess of water and organic emanations may pass into the house. Or ventilation may be imperfect, and the exhalations of a crowded population may accumulate and putrefy; or the excretions may be allowed to remain in or near the house; or a general uncleanness, from want of water, may cause a persistent contamination of the air. And, on the contrary, these five conditions insure healthy habitations:—

1. A site dry and not malarious, and an aspect which gives light and cheerfulness.
2. A ventilation which carries off all respiratory impurities.
3. A system of immediate and perfect sewage removal, which shall render it impossible that the air shall be contaminated from excreta.
4. A pure supply and proper removal of water, by means of which perfect cleanliness of all parts of the house can be insured.
5. A construction of the house which shall insure perfect dryness of the foundation, walls, and roof.

In other words, perfect purity and cleanliness of the air are the objects to be attained. This is the fundamental and paramount condition of healthy habitations; and it must over-ride all other conditions. After it has been attained, the architect must engraft on it the other conditions of comfort, convenience, and beauty.

The *summary of rules* for improving the healthiness of a site may be thus stated:—

1. Drain subsoil and lower the level of the ground water.
2. Pave under houses, so as to prevent the air from rising from the ground.
3. Pave or cover with short grass all ground near buildings in malarious districts.



4. Keep the soil from the penetration of impurities of all kinds by proper arrangements for carrying away rain, surface, and house water and house impurities.”—*Parkes*.

Having selected a site, the surface and subsoil water within the whole area of the barrack enclosure should be drained by tile under-drains to the depth of 4 ft. at the very least, placed at a distance varying from 12 to 18 ft. apart, according to the nature of the soil and fall of the ground; on a slope catch-water drains should be made so as to cut off the flow of water from the higher grounds. Barracks should be built running north and south, so that the sun should have access to both sides of the building; it is also desirable that they be broadside to the prevailing wind; if built on a slope they should be end-on to the side of the hill. In many stations in England these rules have been neglected.

The Commission of 1861 recommended strongly that dryness of the foundations and walls of barracks should be secured. This is a principle in construction fully recognised. The report states—“It is possible, after selecting a favourable site, to so plan and construct a barracks as to secure sufficient sun-light and ventilation outside the building, and so to arrange it internally that a minimum of benefit will result to the occupants of the rooms.”

The following from the Report of the Commission for Improving the Sanitary Condition of Barracks and Hospitals, 1861, is worthy of repeating; it is as applicable to the present and future as when written, and will at all times tend to support M.Os. in any views on these matters which they may consider necessary to express to C.Os.:—

**Arrangement of Buildings.**—No part of a barrack, whether for sick or healthy men, should be placed too close to the boundary walls. There should be always intervening space sufficient to ensure thorough ventilation round the buildings between them and the wall, and to prevent the ventilation being injuriously affected by buildings belonging to the civil population coming up to the walls. Latrines, cook-houses, stores, and other similar buildings can be placed between the barrack and the wall, but the arrangement should be such as not to interfere with its external ventilation.

Barracks, as well as all populous buildings, are best constructed of only two stories of inhabited rooms. Three stories are not objectionable for healthy people, though objectionable for sick. Four stories should only be resorted to when from the dimensions or form of the ground it is absolutely necessary to adopt this number of floors.

Dry stores, staff and regimental rooms for administration, day-rooms, libraries, and reading-rooms may be placed without detriment on the ground floor, with men's rooms over when it is necessary to do so.

Basements should never be used for barrack-rooms, nor indeed for human dwellings. They are always more or less liable to damp, stagnation of air and deficiency of sunlight, and are well known nurseries of disease in civil life.

Each range of barrack-rooms should consist of separate houses, each house having no direct communication with the adjoining houses. To ensure this, the party walls between the houses should be carried above the roof. Each house should be divided up the middle by a wide roomy staircase, extending from the ground to the top flat, with a free ventilation through the roof. The staircase and passages should extend across the house from front to back, with windows on opposite sides for thorough light and ventilation. Besides affording means of access, the stair and passages should be so constructed as to afford ventilation upwards between each half of the house, sufficient to prevent the atmosphere in the barrack-rooms on opposite sides of the stair and passage intermingling.

There should be only two barrack-rooms on each floor of the house, one opening out of the right, the other out of the left hand side of the passages and landings.

**Unit of Barrack-room Construction.**—There should be a unit of size for barrack-rooms, and there should be certain appended parts to each room, so that a barrack of any size may be constructed by simply increasing the number of such units.

We would propose from 20 to 30 beds as the unit of number, the beds being arranged with their heads to the walls on opposite sides of the room.

The unit of space in temperate climates must be 600 cubic feet per bed, in conformity with the new regulations. Each barrack-room should therefore have a cubic capacity of from 12,000 to 18,000 ft.

19 or 20 ft. would be a good width for a barrack-room. It would allow ample space for tables and forms when the beds are made down, and would allow about 11 or 12 ft. between the opposite beds during the day when the bedsteads are turned up. The beds should be arranged with their heads to the walls between the windows. In no case should there be more than two rows of beds between the opposite windows.

This rule holds good in all climates, but more especially within the tropics.

Barrack bedsteads are about 3 ft. wide. When arranged side by side, there should be at least 2 ft. between them, so that the average breadth of each bed space would be 5 ft. Barrack-rooms should not be less than 11 ft. high.

A room 20 ft. wide and 12 ft. high, with five bed spaces along the walls, would give the regulation amount of 600 cubic feet per bed. If the height of the room is less than 12 ft., it would be better to make up the unit of cubic space by increasing the bed space along the walls than by making the room wider.

All men's rooms in permanent barracks should have ceilings. The space in the slope of the roof should not be taken into barrack-rooms any more than into the rooms of ordinary dwelling houses.

These data, which are required for health, will enable properly proportioned rooms to be planned.

There should be about half as many windows as there are beds in the room; they should be on opposite sides of the room; they should be carried up to within a few inches of the ceiling, and be hung so that both upper and lower sashes can be opened or shut.

The fire-place should be placed in the side wall in the centre of the length of one side of the room, and should be constructed to warm part of the air admitted for ventilation. If the room were constructed for 30 beds, two fire-places would probably be required; in which case they should be placed on opposite sides of the room, but not opposite each other.

**The Elements of Healthy Barrack-room Construction are these:—**

1. Accommodation for from 20 to 30 beds per room at 600 cubic feet per bed.
2. Height of room, from 11 to 12 ft.
3. Breadth of room, 19 to 20 ft.
4. Windows equal to about half the number of beds arranged on opposite sides of the room.
5. No more than two rows of beds in any barrack-room; beds to be placed with their heads to the walls, and 5 ft. in breadth at least allowed for each bed.

The *barrack-room unit* proposed for adoption contains: 1. The barrack-room. 2. The sergeant's room. 3. Ablution-room, with fixed basins. 4. A night urinal. These are the recommendations of the Committee on the Elements of Barrack-room Construction. Having fixed upon the unit, the next problem is the arrangement of the units on the best plan to complete an entire barracks:

**Cubic Space.**—*India, in the plains.*—The allowance of space in barracks per man is 1,800 cubic feet; superficial area, 90 ft.; height of room, 20 ft.; width, 24 ft.; wall space for each bed, 7½ ft. The barracks to be two-storied, with a verandah 10 ft. wide to keep off the direct rays of the sun. Not more than 24 men in a room, or 50 men under one roof.

*In the hills*, per man, 1,400 cubic feet; superficial area, 75 square feet; height of room, 18 ft.; width, 22 ft.; wall space for each bed, 7 ft. To gain sufficient wall space is an important consideration in construction. In the various commands abroad there are fixed allowances of space.

*Egypt.*—The amount of cubic and superficial space fixed for our troops in Egypt is: barracks, guard-rooms, and prisoners'

rooms, 750 cubic feet, 60 ft. superficial area; cells, 1,000, and 90; hospitals, 1,500 and 87 respectively per man.

*In hospitals at home and temperate climates*, 1,200 cubic feet and 100 feet superficial area is allowed. The relation of superficial area to cubic space in barracks should be as 1 to 15; in hospitals the superficial space is proportionately greater.

A soldier's allowance of space in temperate climates is about 4 cubic feet for each pound weight of his body. Cattle require one cubic foot of space for each pound of their weight. Thus a man and an ox will have about the same amount of space.

*Hospitals, India.*—In European hospitals in the plains of India 2,400 cubic feet space and 120 square feet area. In the hills—cubic space from 1,600 to 1,800 ft., superficial area, 102 ft. In native hospitals, 1,500 cubic feet and 99 ft. is the space allowed.

*In wooden huts at home*, 400 cubic feet of space is allowed per head; in detached huts, when used as hospitals, 600 cubic feet, or the same number as in barracks.

*Hut encampments* are used on service in cases where a position will remain in occupation for some time. They are usually made of brushwood, straw, reeds, clay, turf, or any other material obtained locally.

“The best form of hut will usually be rectangular in plan, with sufficient width for two rows of beds and a passage down the centre; but where the material available is of small size, one row of beds may be provided, or the hut may be made of circular form. A width of at least 6 ft. should be allowed for each row of beds, and the passage may be from 2 to 4 ft. wide.

“The accommodation may be calculated at one man per foot in length of the hut where there are two rows of beds, and one man to every 2 ft. when only one row of beds.”—*Regulations and Instructions for Encampment*, 1888.

#### **Regulations relative to Construction of Barracks.**—

An infantry battalion of 850 rank and file, composed of eight companies, is the organized unit on which the estimates of providing barrack and hospital accommodation for all troops in the United Kingdom is based.

The following is a synopsis of the instructions for the R.E. Dep., 1887, in connection with the construction of new buildings, and the basis upon which old buildings are to be re-constructed or improved. Although these instructions by the Director of Works differ materially from matters of opinion or recommendations, it is stated that he “desires that officers should continue to weigh for themselves the precise requirements of each case.” Soldiers' room, normal size—length 77 ft., breadth 21 ft., height 10 ft. 6 in.—for 28 men.

Sergeant's living-room, normal size 14 by 13; bed room, 13 by 9. These rooms to be about 10 ft. high.



Barrack-rooms should contain about 600 cubic feet, and from 57 to 60 superficial feet per man in temperate climates; their width should be 21 ft., and their height about 10 ft. 6 in. The room to be divided in the centre by a 9-in. brick wall, with a 7-ft. opening running up to the ceiling, in which self-coiling steel shutters are to be fixed, so that, if necessary, only one-half of the room need be used.

Windows should be placed on opposite sides of each room, about 5 ft. super. of window space (measured within the inside bead of frame) being allowed for each man. The beds should be about 18 in. apart, and their heads 6 in. from the wall. The accommodation of each room may vary from 20 to 32 men.

The top of the stone sill of windows in barrack-rooms should not be less than 3 ft. 3 in. from the floor line. The internal sills should be splayed, and of stone, or other hard material.

Here there is a difference of 6 in. less in the height of barrack-rooms than what was recommended by the Commission. As the amount of cubic space per head is limited, it is better to obtain it as above arranged for, by an increased superficial area rather than by a height beyond 10½ ft. Financially it would be cheaper to gain enclosed space by elevation of a building instead of by superficial extension; so in this instance the financial question has yielded to the scientific one.

**Ventilation.**—The Instructions for the R.E. Dep. state—“Every room intended for habitation should be independently ventilated by one or more outlets for foul air and one or more inlets for fresh air.”

**Outlet Shafts** should have a clear area of not less than one square inch to every 60 cubic feet of room space. This gives 10 square inches per head in barrack-rooms containing 600 cubic feet per man, and 20 square inches per head in hospital wards containing 1,200 cubic feet per bed. When carried up in brick-work or masonry, these shafts should be rendered inside with cement, and, when practicable, should be placed near to smoke flues in order to increase the draught.

Ventilators should be considered with respect to their position, number, size, and form.

**Outlets for Foul Air.**—In rooms on the top floor of a barrack the Commission recommend “shafts with a sectional area of 1 in. to every 50 cubic feet of room space; for the floor next below the upper floor a sectional area of 1 in. to 55 cubic feet of room space; and, where the barrack consists of three floors, the lower floor will require a sectional area of 1 in. to 60 ft. of room space.” This is 10 in. for 600 cubic feet or one man's space. If to this are added 6 in. for the chimney, an outlet of 16 in. will be given for each man, or a little more on account of other openings. This will allow of a change

of air twice in the hour, 1,200 cubic feet escaping per head; half this foul air will escape by the chimney on account of increased draught.

The proper position for a discharge shaft is above, no matter where the inlet is. The size of the outlet shaft should not exceed one foot square; if more outlet is required, a second shaft should be put in. 12 men should have one such shaft—that is, 144 square inches, or 12 in. for each man.

With respect to the admission of fresh air, the Instructions for the R.E.Dep. state—

**Inlets for Fresh Air** should have a clear area of not less than one square inch to every 60 ft. of room space, but where ventilating grates are used (they are constructed to supply half the required amount of fresh air, warmed to about 60° Fahr.) the cold air inlets should be calculated at one square inch to every 120 ft. of room space, which in barrack-rooms containing 600 cubic feet per man gives 5 in. per bed.

To prevent draughts, the cold air should be admitted in an upward direction, at a height of at least 5 ft. from the floor, but in barracks the inlet ventilators are placed about 8 ft. from the floor line, so as to be out of reach. When more than one inlet is required, they should be placed, if possible, on opposite sides of the room. Warm air ventilators should not be more than 8 ft. above the floor, and not less than 1 ft. clear under the ceiling.

The small and large sized ventilators may be taken as giving a clear inlet area of 10 and 20 in. respectively; therefore in barrack-rooms warmed by ventilating grates, and containing 600 cubic feet per bed, one small ventilator to every two beds, or one large one to every four beds should be provided, and in hospital wards containing 1,200 cubic feet per bed, one large ventilator to every two beds.

The inlets should be the same size as the outlets; the aggregate sectional area should be one square inch to 60 cubic feet of space. Half the air admitted to barrack-rooms is supposed to be heated by means of Galton's stoves, which afford about 6 in. per man of opening, while 6 in. of cold air are let in through valves, in all 12 in. of superficial sectional area per man; this is less than the exit, estimated at 16 in., but windows and doors let in enough to supply the difference. The inlets should not be large and single, but numerous, about 50 in. area, and trumpet-shaped where they enter the room, so as to distribute and mix the entering air with that in the room; they should turn upwards to prevent down draughts on the occupants; they should be protected from the outside from too strong winds, which are great obstacles in regulating natural ventilation. The usual sized Sheringham valve is 9 in. by 3, with a sectional area of 27 in.; they are perhaps the best form of inlet. They should

not be placed opposite each other like windows; one valve is sufficient for every six men in a room. Perforated air bricks of the usual size,  $9 \times 3$ , have openings equal to about  $11\frac{1}{2}$  square inches, but the larger size  $10 \times 6$  equal 24 in. All inlets should receive air from a pure source, and should be short, smooth, and easily cleaned.

The velocity of air in a shaft, that is, its ventilating power, will depend, 1st, on the difference of temperature between the inner and outer air. 2nd, on the length of the shaft. 3rd, on the amount of friction in the shaft. 4th, on the force or freedom with which the air to supply the shaft enters both the shaft and the room.

Circular shafts afford the least friction, according to sectional area, and triangular shafts the greatest. From observations taken it appears that the velocity of the air in the square outlet shafts of barrack-rooms is from 3 to 5 ft. per second.

It is important that the outlet shafts and the inlets should be placed as far from each other as possible, to enable a thorough diffusion of the inflowing fresh air to take place among the general mass of air in the room, so that the whole contents of the room may be kept in an average state of purity and temperature; but from the way in which the currents of air move in a room, it is found best to place the foul air shafts to one side or the other of the fire-place and not directly opposite to it.

In a small room the best place for an outlet is in a corner at the end where the fire-place is, away from the door and the windows; the shaft should be surrounded by masonry in order to prevent its cooling when heated by the warm air passing through it. The top should be covered with a cowl to keep out wet; it should revolve so as to turn away from the wind or aid its aspirating power. The inner end should have a louvre, with flanges directed towards the ceiling, otherwise a recurrent cold draught may pass down on a person sitting by the fire, and then it might be correctly said that he took cold by remaining too long in the house.

If a room has two fire-places they will draw against each other, and the fire-place with the stronger draught will supply itself by drawing the smoke down the other chimney, unless it can obtain an air supply with a smaller expenditure of force. For a similar reason, if a closed barrack-room has no other means of ventilation than a foul air shaft and a chimney flue, the fire-place will certainly supply itself by drawing air down the shaft, and troublesome down draughts will be produced. It is essential, therefore, to provide inlets for air to supply both the fire and the ventilating shaft.

**Means of Drying and Warming Barrack-rooms and Hospital Wards.**—The following table gives the different

sizes of the ventilating grates used by the War Office, and their heating power, etc., as stated in the Instructions for the R.E. Dep. before referred to.

Description of Grate.	Size of Opening for Grate.		Maximum Heating Power in Cubic Foot of Space.	Size of Air Duct to Grate.
	ft.	in.		
Large size - - -	3	4	12,000	9 in. x 12 ins.
Medium - - -	3	0	8,400	9 " x 9 "
Small size - - -	2	10	3,600	9 " x 4½ "
No. 4 size - - -	2	4	2,000	4½ " x 4½ "

These grates being intended to supply half the amount of air required for the room, the air duct to and from the grates should have a clear area of 1 in. to every 120 ft. of room space.

Parkes says, the louvre from the hot-air chamber in a large-sized grate lets in at the rate of 2½ ft. per second 4,600 cubic feet of air of a temperature 19° Fahr. above the external air. There is not much power of heating from these grates, either by the admission of hot air or by radiation.

"The subject of ventilation is in cold climates connected inseparably with that of warming, for it is impossible to have efficient ventilation in cold weather without warming the air."

The heat of a room exercises a powerful influence in causing an influx of air through walls in a porous condition; it is also remarkable to what an extent it will abstract ground air and moisture from the soil. In the warming of houses it is difficult to avoid making the atmosphere within them too dry. For warming barrack-room space and hospital wards the allowance of coal is 37 lbs. in winter for 7,200 cubic feet.

**Galton's Grates.**—The principles upon which the ventilating fire-places in barracks are constructed may be thus briefly stated: The grate is intended to be placed as forward into the room as possible; the part in which the fire is placed is of fire-brick, the bottom being partly solid to check the consumption of fuel; a supply of air is admitted from behind the grate and thrown upon the top of the fire to assist in preventing smoke; the sides are splayed so as to throw the heat by radiation as much as possible into the room; a chamber is placed behind the grate, into which air is brought from the outer atmosphere and warmed by a large heating surface at the back of the grate increased by flanges, and after being heated to a temperature of from 56° to 70° Fahr. the air passes into the room by a shaft cut out of the wall which terminates in a louvred opening above the reach of the men. The clear area through the louvres should be much larger than the area of the shaft. The louvres should be bevelled upwards, so as to cause the air to impinge against the ceiling to prevent a cold



draught being felt when the fire is not lighted. They should be easily removable for purposes of cleaning. The air shaft, if formed of brickwork, should be rendered inside with cement and lime-whitened. The minimum area of the shaft should be one square inch for every 100 cubic feet of room space. The stoves are made in two separate parts, so that the front may be occasionally removed for the purpose of cleaning and lime-whitening the air chamber, iron work, and shaft.

It is of some importance that this occasional cleaning of the air chamber and shaft should be done, but of far more importance that the supply of air for admission to the chamber should be drawn from a pure source. See that no gulley grates, drain traps, latrines, gutters, or other nuisances are in the vicinity of this supply, which should be taken from as high above the surface of the ground as possible.

The present Instructions for the Construction of Barracks, 1887, state:—

**Walls, Damp Course.**—“All buildings used as dwelling-houses or offices, or for stores which would be injured by damp, should have a  $\frac{3}{8}$  in. layer of asphalte built into the outer walls, and running 2 ft. into the inner walls, at a height of at least 6 in. above the external ground level.

“*Hollow Brick Walls.*—Walls built of two half-bricks, with  $2\frac{1}{2}$  in. air space between them, are warmer and more weatherproof than 14 in. solid brick walls; but a hollow space is superfluous in walls containing 18 in. of good brickwork. The air space should be next the outer  $4\frac{1}{2}$  in. skin of brickwork. The outer skin should be securely tied to the inner wall by terra-cotta, slate, or galvanized iron ties placed at horizontal distances of 3 ft., and pitched alternately at vertical intervals of three courses. To prevent the moisture from the outer skin being transmitted to the inner wall, the hollow space should be carried down at least 1 ft. below the damp-proof course.

“The air space to be carried round all angles, and up to the sides of all window and door frames, with no points of communication between the exterior and interior walls, except such as are formed by the ties. To prevent the inflow of water, by means of the break in the air space, caused by the door and window heads, a strip of 4-lb. lead should be built into the exterior wall over each discharging arch or lintel, the lead to be  $4\frac{3}{4}$  in. wide, 2 in. being built into the wall, and  $1\frac{3}{4}$  in. should project into the air space, the inside edge being slightly turned up; and it should be carried 2 in. beyond the frames each way, so as to throw the water clear off them. No communication should be made between the top of the hollow space and the outer air. In the construction of stone buildings, all walls are to be lined with a skin of brickwork, unless the stone is of such a nature as to be relied on to keep out damp.

**Drainage.**—"No underground drain should be brought within the walls of any building; but if such an arrangement be unavoidable, it should be disconnected from the sewer by a syphon trap outside the walls, with an air opening to the drain pipe on the building side of the trap, both before it enters and after it quits the building. Glazed stoneware drain pipes of approved pattern, admitting of inspection, should be used. All the joints should be made watertight with cement or with tarred gaskin and cement. Where barrack drains empty into a main sewer, they should be cut off from the sewer by a disconnecting pit placed at a safe distance from any window or other point where it might be injurious or objectionable.

**"Depth below Surface.**—Drain pipes should be covered with at least 2 ft. of well-rammed earth wherever wheel traffic is likely to pass over them.

**"Size.**—The sizes of underground drain pipes will be governed by the amount of sewage which such pipes will have to convey, their fall, and whether periodically flushed; but care is to be taken that the 'scour' is not impaired by using pipes of too large a diameter.

**"Fall.**—House drains should have a fall of at least 1 in 100; for the pipes which receive the house drains 1 in 200 for a 6-in. pipe, 1 in 300 for a 9-in. pipe, and 1 in 400 for a 12-in. pipe, providing for a velocity of about  $2\frac{1}{2}$  ft. per second."

The rule for house drains is 1 in 40 for a 4-in., and 1 in 60 for a 6-in. pipe. The instructions do not recommend such a fall as this.

**"Flushing and Inspection.**—When a proper fall cannot be obtained means of flushing must be provided; and when the drains are deep inspection pits will be necessary, with a lamp-hole at any bend between two pits. Field's Annular Syphon may be used for flushing.

**"Soil Pipes.**—Soil pipes should be at least 4 in. in diameter, and should be run up above roofs and be left open to the air; they should be of cast-iron, the joints being carefully made good with red lead, and be carried down outside the building. Any portion within the walls of a building must be of 8-lb. lead. The connection with the drain leading to the sewer should always be made outside the building."

Dr. Carpenter makes the following remarks with respect to the laying of pipes for sewers and drains:—

1. The drain pipes must be made of impervious material.
2. They must be perfectly jointed so as not to leak.
3. They must be perfectly smooth internally.
4. Their diameters must be the smallest that can be used.
5. The gradient not less than 1 in 50.
6. They must be laid upon a solid bed of concrete. Before being covered over, and after the cementing material has

dried, they should be carefully tested by filling them with water and exposing them to a certain amount of pressure, to prove their soundness.

7. They should then be covered with concrete.
8. There should be inspection chambers, capable of easy examination at frequent intervals, and at every junction.
9. When smaller pipes lose into larger ones, a tapering pipe should be used, not (as is usually done) a smaller directly filled into a larger.
10. Large sized drains should never discharge into smaller ones, that is, a 6-in. into a 4-in. pipe.
11. No drain in direct communication with a sewer should pass through the wall of a building.
12. But if a drain, having indirect communications, do pass through the wall, there should be no pressure upon the pipe, an arch being turned over it.
13. When syphons are used as traps, they should have a smaller diameter than that of the pipe itself.
14. There should be no direct communications between the interior of the house and the house drain.
15. In laying house drains care must be taken to avoid the roots of trees. When trees come in the way, there must be an extra layer of concrete around the pipe, both above and below, otherwise the roots, in due course, will lead to displacement and stoppage.
16. Sewer pipes should never be jointed with clay, cement only being used; and this must always be surrounded with concrete, unless the pipe is being carried through a bed of actual clay.
17. Drain pipes should never be laid inside a dwelling-house or school. If in closely packed towns it becomes absolutely necessary to pass under the house to get to the sewer, the drain should be included in a thick bed of concrete or asphalte.
18. Every drain must be thoroughly ventilated, so that no stagnant air should remain in any part of its course.

In barracks the outlet pipes of sinks, urinals, ablution-rooms, and baths, should never be directly communicated with the sewers.

**Water.**—Soldiers in barracks require 15 gallons a head daily, thus:— $\frac{1}{2}$  gallon for drinking;  $9\frac{1}{2}$  gallons cook-house, ablution-room, washing barracks, clothes, &c.; 5 gallons latrines. In hospital 30 gallons a head will be required for all purposes.

The Q.R. state that a rate of 20 gallons per diem for each officer, man, woman, and horse, and 10 gallons for a child will afford a liberal supply. This is considered to be the maximum allowance for all purposes in quarters.

The following are some of the regulations for construction in connection with the storage and supply of water to barracks, estimated for a battalion 850 strong:—

When the water supply is not constant, or when it is obtained from a private company, a tank for about 10,000 gallons (for a barrack to take a regiment of infantry, calculated at about 10 gallons per head), filled direct from the main, or by pumping if necessary, should be placed so as to command all the barrack buildings, the water being turned on daily from it to the different cisterns at such times as to admit of its being kept full in case of fire.

*Cisterns* to be filled daily at a fixed time should, whether the supply be constant or not, be provided for the distribution of the water, the water being turned off the barrack mains after the cisterns are full, in order to prevent waste. These cisterns should each contain about a two days' supply, calculated as follows:—

*Ablution-rooms.*—30 gallons per bason; 30 gallons per foot bason.

*Baths.*—250 gallons per bath; also a hot-water cistern for 50 gallons per bath in hospitals.

*Canteen.*—Half gallon per head, on accommodation for N.C.Os. and men.

*Coffee-bar to Recreation-room.*—Half gallon per head on accommodation for N.C.Os. and men.

*Cook-houses.*—Three gallons per head on accommodation for unmarried men.

*Hospital kitchen.*—Three gallons per bed.

*Infection ward.*—25 gallons per bed.

*Latrines.*—20 gallons per compartment. The flushing water should be delivered into a cistern capable of holding not less than 10 gallons per seat. When salt water is used for flushing purposes gun-metal fittings must be used in place of brass.

*Married quarters.*—50 gallons per quarter.

*Mortuary.*—50 gallons.

*Officers' mess.*—15 gallons per officer.

*Sergeants' mess.*—Three gallons per sergeant.

*Sinks for officers' quarters.*—80 gallons per sink.

*Stables for saddle horses.*—16 gallons per sink.

*Stables for draught horses.*—20 gallons per horse.

*Taps in yards.*—80 gallons each.

*Urinals.*—20 gallons each.

*Wash-houses.*—60 gallons per trough.

*Water closets.*—60 gallons each.

*Workshops* (for armourer, carpenter, and plumber), 50 gallons.

*Cisterns.*—Cisterns supplying the w.cs., urinals, and hospital sinks, to be kept distinct. Small feed cisterns, supplied from



the general cistern, may be used in connection with w.cs. Cisterns up to 200 gallons may be of slate, above which, or where exposed to severe frost, they should be of wrought iron galvanised, or of cast iron.

All cisterns in exposed situations to be protected from frost, and when necessary to be covered in from the sun.

Lead pipes should not be used for soft water intended for cooking or drinking purposes; lead-lined cisterns should not be used for any water intended for drinking purposes.—*Instructions for Royal Engineer Department.*

As far as possible all reservoirs, tanks, etc., should be covered in and ventilated, deep rather than extended, so as to lessen evaporation and secure coolness; hydraulic mortar should be used in their construction. Iron is the best material for the construction of tanks, cisterns, pipes, etc.; the word cistern is applied to the supply tanks in barracks. Care should be taken that there is no leakage of pipes into them; a common source of contamination is an overflow pipe passing direct into a sewer, so that the gas passing up is absorbed by the water. This cause of contamination is avoided by the constant supply of water, as cisterns on the premises are not required except for closets.

The contamination of water and mode of examination to ascertain its quality are subjects which cannot be more than mentioned here. The action of water on metals is also a matter of great importance. The quantity of metallic substances which would cause it to be condemned for drinking purposes may be stated:— $\frac{1}{20}$ th of a grain of lead in a gallon of water is dangerous;  $\frac{1}{10}$ th of a grain should cause it to be rejected; the  $\frac{1}{100}$ th of a grain is said to affect some people, and its use, if continued for any length of time, may cause dyspepsia, if not more aggravated symptoms, such as colic or paralysis of the wrist. A blue line on the gums, which is supposed to be a specific symptom connected with lead poisoning, is not observed where the teeth are absent, as it is formed of sulphate of lead, due to the decomposition of particles of food which adhere to the teeth.

The water which acts chiefly on lead is the purest and most highly oxygenated; also those which contain organic matter, nitrates and nitrites, and probably chlorides. Rain water is highly oxygenated, and contains nitrous and nitric acid salts, and ammonia absorbed from the atmosphere. The waters which act least on lead are those containing carbonic acid, calcium, carbonate phosphates, and sulphates. Carbonic acid forms an almost insoluble carbonate of lead, and is in this way protective. Lead or zinc pipes which contain lead in their composition, if bent against the grain, may cause absorption of lead by the water. Vegetable acids and fatty acids from fruit, vegetables, sour milk, cider, beer, etc., act on lead.  $\frac{1}{10}$ th of a grain of copper and  $\frac{1}{2}$  a grain of iron to the gallon should cause it to be rejected.

Zinc has been known to get into water conveyed in galvanised iron pipes. Albuminoid ammonia in air or water is the most reliable indication of organic contamination. Its presence and quantity is best ascertained by means of Nessler's test.

Nitrates and free ammonia in large quantities may be found in deep wells, where the water is drawn from under chalk formation, as, for instance, the well which supplies the town of Sheerness, which is over 800 ft. deep. The boring in this instance passes through 305 ft. of chalk. These nitrates come from fossils.

For water in camp, *see* p. 389, and on board ship, p. 365.

## CHAPTER VIII.

## FOOD, WITH SPECIAL REFERENCE TO THE REGULATIONS WHICH GOVERN ITS SUPPLY TO TROOPS.

**Food.**—Within the regions of science the subject of food is an important and comprehensive one: while the political economist views it only in its relation to such facts as have an influence on the accumulation of national wealth, the philosopher views also those facts which have a reference to the character of man, the development of his physical power and intellectual faculties, etc., associating food with physiological facts, the advancement of scientific research, and mental progress. The capabilities of an occupied country to supply an army by requisition on its inhabitants will, as a rule, depend more on the commercial enterprise and progress of its people than on its own inherent producing qualities. A campaign to be successfully conducted should be planned with due regard to such philosophical considerations, as well as the physical features and military and medical topography of the country embraced within the zone of its operations.

Adopting the same course with respect to food as has been done in the case of ventilation, reference will be made to some of the more prominent chemical and physiological facts in connection with the subject. Matters relative to the composition and assimilation of food and the purposes it is intended to fulfil in the animal economy will be introduced, and while dealing with the subject more particularly from a military labour point of view, attention will be directed to the relations which exist between the physical forces and food.

The responsibility of the Medical Staff with respect to the soldiers' rations is not confined to the expression of an opinion as to whether the food supply is good and wholesome and fit for issue or otherwise. More than this, by reason of his profession and the intimacy of the relation of food to health, the medical officer must be deemed a competent adviser on all questions of quantity, quality, necessity, and variety, as well as the value of food as a force producer in its relation to physical labour—everything, in fact, appertaining to food, including the process adopted for its preservation, and the efficiency of local means for its preparation, except perhaps those duties connected with collecting or otherwise providing, stowing, transporting, and issuing, services conducted by the Supply Department. The responsibility of the M.O. in all matters relating to food is intimately associated with that of the commanding officer as his responsible adviser.

Everyone knows that food should be agreeable, digestible, and economical, but as regards quantity and description, or the nature of food necessary to fulfil these and other requirements, it is very desirable that those interested in the subject, such as an officer intrusted with military command, should have some knowledge of the principles on which various articles of food are given, with the object of sustaining the physical condition of his men. The following considerations are of recognised importance in assisting the employer of labour in arriving at a practical deduction on the victualling of his employés, and no more necessary estimate can be made by a general officer who has war material placed at his disposal than the maintenance of the physical powers of his troops.

Under no circumstances can the principles relative to food and work be more directly and beneficially applied than in the case of the soldier in the field; what amount of physical exertion constitutes a fair day's work, and how much is excessive, injurious, and ultimately wasting and destructive, and what amount of food and of what nature will be necessary to sustain the individual in health and vigour, and repair the injuries consequent on fatigue or over-exertion, are all questions of vast importance which have already been subjected to careful enquiry.

"While civilians, labourers, and mechanics," exclaims Colonel Graham in his admirable work, "*Military Ends and Moral Means*," "are reposing in their beds, the soldier upon active service is often without shelter or sufficient food, and exposed to the risk of death at every instant. Such hardships are inseparable from his condition, but it is not the less true that those charged with the responsibility of providing for his wants have a sacred trust confided to them."

On this point Colonel Furse, in his book, "*The Line of Communications*," says:—

"Nothing is so demoralising as the issue of insufficient or bad food to young troops, and the British soldier, unfortunately, is more dependent than the soldiers of any other nation on the nature and punctual delivery of his food. In this particular he offers a great contrast to the early Roman soldier, who cultivated the powers of endurance as a military virtue. He is not as frugal as the Russian, Turkish, Spanish, or even French, and breaks down the moment the ordinary issues fail.

"The supply service exercises a great influence on military operations, as the mobility of an army depends in a great part on the system followed. It is the branch of military administration to which we should devote special attention, as on it pivots the success of every military undertaking."

General Sherman says—"He (the general) must give the subject his personal attention, for the army reposes on him alone,



and should never doubt the fact that their existence overrides in importance all other considerations. Once satisfied of this, and that all has been done that can be, the soldiers are always willing to bear the largest amount of privation.

“The proper supply of food to his soldiers, of suitable clothing, according to climate, of shelter from the weather, of prompt medical assistance to the sick or wounded, are four very important duties of the commander of an army; duties which he should never neglect personally to attend to. Who after all should take so much interest in the welfare of the soldiers as the general, who owes them a lasting debt for his fame, towards the attainment of which they so largely contribute?”

In continental armies the soldier during peace receives a full ration from Government, and but little or no money wherewith to supplement it if defective, or if he seeks variety; consequently his proclivity for foraging is fully developed when taking the field. But this disposition to self-help is soon acquired by the British soldier when campaigning.

The staple commodities of meat and bread for our army are arranged for under the authority of one of the administrative departments of the War Office, and are supplied by contractors under local military supervision. The responsibility of the G.O.C. a division in time of peace with respect to these supplies is little more than nominal, both on account of the way contracts are entered into and executed, besides military etiquette does not permit him to interfere with the preparation or distribution of food in barracks, which is conducted under regimental administration, and for which the O.C. is responsible. All transactions respecting the issue of Government rations, which form but a portion of the soldiers' food in barracks, are carried on between the supply department or contractor and the soldiers' immediate C.O. With respect to the victualing of troops in the field under our contract system I have known a general officer left without a voice in the matter at a time when the troops under his command were being but badly served.

Custom, perhaps the outcome of necessity as much as natural instincts, acting on a people throughout generations, or acquired as a habit in individuals occupying a country, should not be overlooked in the selection of their food. The region of the earth inhabited, both by reason of its relation to commerce and the nature of its productions, induces a mode of life, habit of body, and the adoption of a food in accordance with the conditions under which men live. These are questions associated with natural history, but should be regarded as matters of fact in framing a scale of rations for troops. Adopting this in principle, the model upon which the ration should be framed will be in accordance with the dietary in use by the well-to-do

inhabitants rather than that of the poorer people, as the former are in a position best able to satisfy their wants by a selection of food. Moreover the position to which they have attained is probably due to their superior physical condition.

The digestive activity or power of assimilation of foods differs so much among men, even independent of race, by reason of age, climate, exposure, or the nature of their duties, as to render the principle of a general ration for troops scarcely scientific; thus the problem of a standard field ration for troops for adoption under all circumstances is rendered most difficult. The wants of an army, even under favourable conditions, are so great and varied that it is absolutely impossible to meet them by any precise calculation of days and rations, independent of a chance local supply. Among the resources of a country, as well as its natural products, the strategist must estimate its stored food supply and granaries, while, as a matter which will add materially to his own resources, the scientific preparation of foods, tinned meats and preserved vegetables, which are capable of being conveniently transported, must be reckoned.

**Relations between the Physical Forces and Food.**—Taking a broad view of our subject, it is requisite to refer to certain doctrines concerning the relation of food to force, and the relation of the physical forces to one another. Matter can neither be created nor destroyed; although it may be variously combined and modified, it remains the same in essence and unaltered in amount. Force, appreciable only as a principle of action, is similarly conditional, and, like matter, it can neither be created nor destroyed. Food must be considered in relation to this principle.

The earth's matter remains fixed in amount, but under the form of heat and light force is constantly being transmitted to us from the sun, and it is by reason of the force thus derived that life on earth is maintained.

**The Relation of the Physical Forces and their Dependence on One Another.**—It was Grove who first demonstrated that one kind of force was capable of producing another. The expression "Correlation of the Physical Forces" which he employed meant the "reciprocal production" or capacity of one force to produce another, and to be in turn itself produced by it. Thus heat, light, electricity, magnetism, chemical affinity, and motion are correlative or have a reciprocal dependence. This doctrine further holds that no force can originate otherwise than by an antecedent force.

**Energy.**—The term force, when used in a strict sense, is distinguished from energy. By *force*, under a rigid signification, is understood the power of producing energy; by *energy*, the power of performing work. For instance, powder has force, the cannon ball energy; but to speak of the force of the cannon ball is inexact.

*Potential and Actual Energy.*—Potential energy signifies energy in a state of rest—capable of doing work, but not doing it. Actual energy is energy in an active state, actually doing work. Potential energy converted into actual energy must expend its force before it becomes latent; irrespective of whether this transformation takes place rapidly or slowly the amount of expenditure is the same. The cross-bow affords a familiar illustration of the two conditions; when the strained cross-bow string is started by the trigger, the stored-up energy becomes manifested in the recoil of the bow, and this is the exact equivalent of the amount expended in drawing back the string from the position from which it was liberated. Had the string, instead of being liberated instantaneously, been eased off slowly and held in check, the expenditure, although extended over a more lengthened period, would be the same.

**Nerve Force.**—The dynamic principle of vesicular neurine, once liberated at the sensorium, *must* be expended in some direction. When in excess of the requirements of the individual, it flows into those channels which are not under control of the will, and which are the ones most habitually used. Some years ago I directed attention to nerve force as one cause to which the prevalence of heart disease among soldiers was due.

“Darwin, in his book on ‘Expression of the Emotions in Man and Animals,’ 1872, writes: ‘The heart, which goes on uninterruptedly beating night and day in so wonderful a manner, is extremely sensitive to external stimulants. The great physiologist, Claude Bernard, has shown how the least excitement of a sensitive nerve reacts on the heart, even when a nerve is touched so slightly that no pain can possibly be felt by the animal under experiment; hence, when the mind is strongly excited, we might expect that it would instantly affect in a direct manner the heart, and this is universally acknowledged and felt to be the case. Claude Bernard also repeatedly insists, and this deserves special notice, that when the heart is affected it reacts on the brain, and the state of the brain again reacts through the pneumogastric on the heart, so that under any excitement there will be much mutual action and reaction between these the most important organs of the body.’

“During recruits’ drill, owing to the disturbed state of the mental faculties, individuals being perplexed, annoyed, or otherwise agitated, a large amount of nerve-force is generated by the vesicular neurine of the cerebrum, in the ordinary course of events to be transmitted to the muscles, and this force, under the natural or ordinary conditions of life, where man is a free agent and free from the restraint of discipline, would be expended in muscular efforts—by gesticulations, walking up and down, or by letting those who gave rise to such feelings partake of his mind. But no such safety valve is open to the soldier. On parade all such voluntary expressions of the emotions, by word or gesture, are strictly forbidden, and we shall see that it is a fact, that under these conditions they do manifest themselves in the first instance in those muscular efforts which are *involuntary and most habitual in their action*. Here, then, as the

heart's action is involuntary, and the most constantly worked organ in the body, it of course will be the first and mostly affected if any causes should give rise to mental disturbance in the soldier."\*

Recently soldiers are permitted to use their voices, and thus expend energy while undergoing many of their drill practices.

When the foregoing doctrines are so far extended as to embrace the thoughts, which are the outcome of an intellectual process, and which as the forces of the intellect have presumably an equivalent as much as in the instances mentioned, we come upon the debateable ground of the relation of "mind to matter," a sort of No-Man's Land, but for our own purpose these doctrines materially assist in forming a clear conception of the relation which food bears to muscular exertion.

**Relation between Heat and Energy.**—A numerical relation between heat and mechanical energy was first established by the late Dr. J. P. Joule, of Manchester. He demonstrated the dynamic equivalent of heat by conducting experiments after the following manner:—He suspended a weight over a pulley by means of a string, which was then wound round an upright spindle; to this were attached paddles which were immersed in a vessel of water. It was found that the force due to the falling of the weight by causing the paddles to revolve and agitate the water raised its temperature. This increase of temperature was always in exact proportion to the amount of force expended in its causation.

**English and French Heat Units.**—The amount of heat required to raise the temperature of one pound of water  $1^{\circ}$  Fahr., represents the dynamic equivalent of the power required to lift one pound 772 ft. high, or the fall of 772 lbs. from a height of one foot or of one pound 772 ft. will give rise to an amount of heat sufficient to elevate the temperature of one pound of water  $1^{\circ}$  Fahr.; further, if a pound weight be let fall from the same height its impact with the earth would give rise to heat, the equivalent of the amount of force expended in its elevation.

These are the ascertained equivalents of heat and motive power. The English heat unit, based on Joule's estimate, is 1 lb. water raised  $1^{\circ}$  Fahr.; should this be converted into mechanical work it would raise 772 lbs. one foot high, or, as it is usually expressed, "foot-pounds." As the work of the human body is capable of lifting 500 tons one foot high in the 24 hours, in estimating the equivalent of energy to food or mechanical work of the body, it is stated as if one ton were raised one foot high, expressed as "foot-tons." This is the equivalent used in calculating scales of rations or diets.

The English heat unit, equal to 772 lbs., is about one-third of a ton (2,240 lbs.). The French heat unit is on a much smaller

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\* "The Causes of Origin of Heart Disease and Aneurism in the Army," page 38. By Surgeon-Major W. E. Riordan, M.S. 1878. Fannin & Co., Dublin.



scale, based on the equivalent of heat required to raise one cubic centimetre of water, about one egg-spoonful,  $1^{\circ}$  Cent. This is known as the "metrical heat unit," about 251, or equal to one English unit.

**Conservation of Energy.**—"The doctrine of the 'Conservation of Energy' implies that energy is as indestructible as matter, that a fixed amount exists in the universe, and that however variously it may be modified, transferred, or transformed, in spite of all the changes of which it may be the subject throughout the realm of nature, it cannot be created or annihilated, increased or diminished. The doctrine further implies that the different forms of energy have their definite reciprocal equivalents; that so much chemical energy, for instance, will produce so much heat, which is the representation of so much motive power, and so on. Food in relation to the production of energy, accepted as applicable to the physical forces, 'conservation of energy,' is now applied to muscular force, and animal and vegetable heat, etc. In living nature the forms of force which we observe in operation are all primarily derived from the sun. The force evolved in muscular action has its source in the material which has been supplied to the body in the form of food. All food comes from the vegetable kingdom directly or indirectly, and vegetable products are built up through the agency of the sun's rays. The energy contained in these rays is fixed or rendered latent in the vegetable, just as the muscular energy which drew the cross-bow string is stored up. Such energy is ready to be again liberated on exposure to conditions favourable to oxidation, and with a manifestation of force, whether rapidly or slowly evolved, neither more or less than the equivalent of the solar force used in the formation of the product. This is supposing complete oxidation to occur; but in the process of animal life, although fully oxidised compounds, like carbonic acid and water, are formed and discharged, yet others, like urea, are expelled in an imperfectly oxidised state, and carry with them a certain amount of latent or unutilised force.

"Thus it is that the various forms of force manifested in the action of animal life trace their origin to that emitted from the sun. Plants are the media for fixing solar force—for converting actual into latent or potential energy. Animals reconvert latent into various forms of actual force. Thus in the various forms of actual force liberated by the actions of animal life, we have the equivalent of that which has been fixed by plants from the sun. As there is a revolution of matter, so there is a revolution of force within and around."—*Professor Pavy*, "Food and Dietetics."

Here then are seen some of the fundamental principles of universal acceptance both recognised and adopted in estimating the exact relations which exist between the physical forces and food.

Plants possess the property of building up complex bodies out of simple products, such as water, mineral salts, carbonic acid, and ammonia; they can only effect this operation through the influence of the sun. Animals which consume plants have the power of re-arranging their constituents, reducing and restoring them to organic matters. The re-constructive process by which living organisms are enabled to convert to their own use suitable materials is called *assimilation*; this is a vital process, different from chemical change; yet in many instances such a change, which always accompanies vital action, is the only manifestation of its activity. The laws which relate to the movements of inanimate objects also apply to the action of living structures; thus the application of chemical and physical laws materially assist in ascertaining the causes of the material phenomena connected with life. Medical science, on account of its dealing with "life," is necessarily of an uncertain character.

Food is required for man; therefore man should be the first study in connection with the subject. Among animals man is the only one which prepares his food; he is a complex feeder, and he should also be a scientific feeder.

Wherever living changes take place nitrogen is present; it is the essential basis of structures possessing living properties. Every muscle, nerve, gland, cell, and structure capable of producing a manifestation of energy, mechanical motion, chemical or electrical action or the absorption of oxygen, is nitrogenized. Except fat, every tissue in the body contains nitrogen. Although four-fifths of the atmosphere are composed of nitrogen, still in this free state it is not available for utilisation by either animals or plants; both get it in a state of combination. Animals obtain nitrogen from their food, and plants what they require from the ammonia in the atmosphere; although there is only one part of ammonia in a million parts of air. Hydrogen and oxygen are supplied to plants chiefly in the form of water.

Chemically the component parts of animals are the same; so animal food should be the most easily appropriated to our use. All food must contain elements capable of conversion into the materials of which the body is composed, as well as supplying sufficient to be expended as force; thus where vegetables alone are taken they must be possessed of the same elements as the flesh of animals, otherwise they could not sustain them.

To enable an individual to do work, his food should be augmented on a scale according to the increased physical exertion required from him over and above what is necessary for carrying on his own inherent vitality. This principle is adopted in prisons, where the scale of diet is regulated according to labour; with the soldier on service; and in the case of troop-horses during the drill season, when an increase of corn is made to the forage.

The production of energy is due to the union of atmospheric oxygen with the organic matter in food and in the tissues of the

body. What is required in food is matter that is capable of oxidation, or of undergoing change in the system under the influence of oxygen; what is required in an individual, in order to convert it to his own use, is the power of assimilation.

**Division of Food.**—Food may be divided into nitrogenous and non-nitrogenous; the latter is sub-divided into hydro-carbons or fats, including wax and vegetable fats, and carbo-hydrates, which include all starches, saccharine substances, and gum.

The former sub-division consists of carbon and hydrogen, and a small amount of oxygen not sufficient to convert all the hydrogen into water. The proportion of unoxidised hydrogen to carbon is about 1 to 7. In 1 oz. of fat the water-free constituents are carbon 336 grs., hydrogen 41 grs.

The elements contained in the latter sub-division are carbon, with oxygen and hydrogen in such relations to each other as to be in the exact proportions to form water. The proportion of water to carbon is about 3 to 2. In 1 oz. of starch there are 194 grs. of water-free carbon. Non-nitrogenised food, by reason of the animal heat evolved during its combination with oxygen in the system, is sometimes called “calorific” or “respiratory food.”

This division of food does not include other substances which are necessary for growth, nutrition, and the formation of secretions; from about  $\frac{3}{4}$  to 1 oz. of mineral matter is required daily in food. Then there are “food accessories,” such as tea, coffee, cocoa, and stimulants which are not included; although essential to the comfort of civilised beings they cannot be regarded as necessities of life.

**Albumen**, which is typical of nitrogenised food, Mulder analysed as follows: carbon 53·5, hydrogen 7·0, nitrogen 15·5, oxygen 22·0, sulphur 1·6, phosphorus 0·4 in a 100 parts. Some nitrogenised foods when subjected to the action of an alkali and heat yield a substance called “proteine;” it consists of carbon, hydrogen, and oxygen, supposed to be previously in connection with sulphur or phosphorus, but is now regarded as the result of chemical action, and not supposed to exist in the compounds from which derived.

Substances which yield proteine are the “albuminoid group,” and are in this way distinguished from other nitrogenised substances, such as gelatine and chondrine, which are in bone, cartilage, and fibrous structures generally—in fact, in all structures used for mechanical purposes or connected with the passive organs of locomotion.

The albumen contained in wheat and seeds of this class is of the same chemical composition as what exists in animal structures, and both serve the same purposes when taken as food. But animal nitrogenised matter, such as fresh beef, has its component elements so prepared as to render it more easily assimilated than what is found in vegetables, and thus it invigorates the system more readily when depressed from any cause—

fatigue, exhaustion, debility from climate, etc.; moreover, as well as restoring the system, it increases in a more marked manner the red corpuscles of the blood, and acts as a rapid stimulant to oxidation and consequent manifestation of energy. General Sherman said, as a result of his experience, that the best food for a soldier was "beef on the hoof," or words to that effect.

It is fatal to health for a person to feed on the albumen of his own organization, and, far short of this, he must not be deprived of an abundance of albumen in the fluids of his body. This store of albumen, which is necessary for the vigour of the body, and for its power of resisting disease, is most readily replenished by the taking of animal albumen. *See p. 261.*

All nitrogenised alimentary principles must undergo stomachic digestion and transformation before they can be utilised in the body. Converted into peptone, they are absorbed by the gastric veins and conveyed through the vena portæ to the liver. The urea, which passes off by the kidneys, probably enters the general circulation with the blood from the liver. The intestinal juice possesses some influence on such nitrogenised substances as may pass the stomach, but the bile has no active properties in connection with them.

*Use as Food.*—Albumen is essentially necessary as food; it renovates nitrogenised tissues, regulates nutrition, oxidation, and the disposal of energy. Taken in excess of what is necessary for waste and repair in connection with vital activity, and the maintenance of the organism, it becomes converted into fat or a heat-producing agent, also into urea; thus its otherwise injurious or poisonous effects are prevented, but at the same time it is likely to overstrain the hepatic functions, and to cause acidity and gout. Owing to the power of nitrogen to control and regulate the application of oxygen in its action on foods, if not taken in sufficient quantity and in a relative proportion they are not utilised, and in this way a loss is effected; when a very insufficient quantity is consumed, it is considered that the amount of water in the system is increased, the contractility of the muscles lessened, and the body predisposed to disease; hence in a measure the prevalence of epidemics in defectively nourished communities.

Pavy calculated that one-third of the albumen taken as food will be converted into urea; as this is but a partially oxidised material, there is loss of potential energy or capacity for force production, estimated as equal to one-seventh of the nitrogenised food taken; albumen contains 15.6 per cent of nitrogen, that is, 1 oz. contains 69 grs. The weight of albumen in food multiplied by 0.158 expresses the weight of nitrogen.

**Gelatine** is a substance of entirely animal origin; it contains no phosphorus. It has the property of setting into a jelly when cooling, as may be seen in soups and also in foods containing isinglass, of which one per cent. is sufficient to cause it to set.



This property of setting is lost after heating the food containing it two or three times. Prolonged boiling at  $220^{\circ}$  Fahr. decomposes gelatine, and destroys its property of coagulation and nutritive qualities. The substance in fruits and vegetables from which jelly is made is quite a different article.

*Use as Food.*—Gelatine has certainly not above one-quarter the nutritive value of albumen, probably much less, as far more of it passes off as urea and is lost. Although a very inferior article as food, it has some histogenetic or tissue-forming properties, and may also form fat after the manner of other nitrogenised substances. Thus undue value should not be placed on the thick-set jelly extracted from bones; its strength is more apparent than real; there is also a great public delusion in connection with the retaining of stock soups.

**Fat** consists of a fatty acid and the base glycerine. On addition of an alkali, it saponifies with soda to make a hard soap, with potash a soft soap, during the process liberating glycerine. The great heating and lighting properties of this and other hydrocarbons is due to the amount of carbon and hydrogen they contain in proportion to oxygen. Fat is little more than melted in the stomach, and after being emulcified by the pancreatic juice, it is absorbed by the villi of the small intestines. The digestive powers of the pancreatic juice and of the bile are partly due to the presence of fat; its influence is very important in connection with the primary formation of the colourless corpuscles of the blood.

*Use as Food.*—As a heat-producing agent it has the power of appropriating about 2.4 times as much oxygen as starch, and consequently will develop 2.4 times as much heat during oxidation, with its equivalent of force. Fat also assists in the digestion of carbo-hydrates and albuminoids, in the latter case influencing the process of tissue formation and nutrition; by thus preventing waste of the tissues, it may be regarded somewhat after the manner of a lubricator of machinery. Taken as food it prevents a feeling of hunger, and in a marked manner diminishes thirst. If for no other reason than this latter, the amount in the British soldier's ration should be increased. Fat beyond a certain point is not digested.

**Starch** as such is not utilised in the system; but by taking two equivalents of water it is converted into sugar; this change is due to the action of the saliva. A similar change occurs in seeds when germinating or malting by fermentation. By boiling with dilute acid the intermediate substances gum and dextrine are produced.

Sugar is the only carbo-hydrate taken up by stomachic digestion. Acids tend in a remarkable manner to prevent the primary digestion of starchy foods. If starch escapes the necessary change due to salivary digestion, it is subsequently acted on by the pancreatic juice or other secretions thrown into the intes-

tines. Although starchy food is not desirable for infants before the salivary apparatus is developed, still the pancreatic and intestinal juices enable them in a measure to utilise such food. The chief difference between natural digestive fluids taken as a whole is, if acid they act on nitrogenised matter, if alkaline on non-nitrogenised. The reaction of the pancreatic juice is always alkaline; thus it is reasonable to suppose it does not materially effect any nitrogenised substance that may happen to pass beyond the stomach.

*Use as Food.*—Carbo-hydrates do not contribute to the maintenance of structures in the same manner as fats do; by the oxidation of the carbon they contain, they yield heat and force; they contain within themselves the means of oxidising, independent of the oxygen of respiration, the hydrogen in their composition.

Alum is the most common adulteration of bread. By its action it causes an arrest of those changes in the starch which are necessary for its easy and perfect digestion. With respect to this adulteration, Dr. C. B. Fox, in his work, "Water, Air, and Food," says—"If the grain of wheat is subjected to warmth and moisture—as, for example, from long exposure in the fields, or from storage in warm, damp granaries—a certain degree of germination occurs, an action which is accompanied by the conversion of the albuminous matters into diastase (a substance that changes part of the starch into dextrine), and a saccharine body called glucose. In the manufacture of bread from this damaged and partially fermented flour a larger quantity of sugar is formed from the starch under the influence on it of the diastase than is desirable, a sweetish, unpleasant, dark-coloured loaf being the result.

"Alum, if added to damaged flour, checks the action of the diastase on the starch, and thus prevents its conversion into dextrine and sugar, at the same time improving the colour of the bread.

"Damaged flour being apt to create dyspepsia and diarrhœa, this astringent salt is found to neutralise to some extent these ill effects. The scoundrels who thus swindle the public by passing off as a superior food of the first quality, at a high price, an unwholesome and impure or doctored article are happily amenable to the law." "Many scientific chemists," he continues, "who have but a smattering of medical knowledge, consider that alum in bread is harmless, except perhaps when present in large amount." See pp. 246, 248.

Chemical action during oxidation produces heat, and we have seen that heat and mechanical work are mutually convertible, and have a fixed quantitative relation to each other. Thus a given amount of heat is transfusible into a definite amount of motive power, capable of performing a fixed and ascertainable amount

of work. Consequently, having adopted a unit as the basis for calculations of comparison, and knowing the chemical composition of any article of food, we go a long way towards estimating what its value as a force producer ought to be within the body when assimilated and fully used up. By experiments it has been ascertained what are the actual heat or force-producing powers of different articles. Thus one ounce of dry albumen, when burnt in oxygen, yields a degree of heat the equivalent of 173 foot-tons; fat, similarly treated, 378 foot-tons; and starch, 138 foot-tons. Here are represented the three divisions of food, showing the amount of *potential* energy in each substance, ascertained by reason of its conversion into *actual* energy when thoroughly oxidised and consumed out of the body.

Albuminoids as food for man in a normal condition, doing a fair amount of work, ought to be about 4·3, "water free," or, say, 10·3 daily, as ordinarily consumed, and taken in the proportion to non-nitrogenised substances as 1 to 4, containing nitrogen to carbon in the proportion of 1 to 15. It may be added, to assist memory, that the regulation allowance of barrack-room space for a soldier is about 1 cubic foot for each 4 lbs. bodily weight, and the proportion of superficial area to cubic contents is about as 1 to 15 in barracks. Albuminoids are necessary for the development, renewal, and maintenance of the body, so that it may be kept in a good serviceable condition. This is the special function of nitrogenous food; but, as well as fulfilling this purpose, in a measure, it contributes towards the production of fat, and perhaps, in this way, directly to the production of force. However, its utility in this respect is not considered to be above that of a carbo-hydrate. The best material for the production of working power is fat. About 3½ ozs. will be required for expenditure. It is, as before mentioned, nearly 2½ times as effective a force producer as the carbo-hydrates, which may be regarded in man's food as supplementary, filling up, as it were, whatever is defective for force production, heat, or mechanical work. It is a mistake to say that the natives of India live on rice, although it forms a staple commodity in their dietary, and a more heat-forming food may not be desirable in India; still they do not live on rice alone. They take in addition "ghee," a form of butter; also "dhal," which contains different varieties of pea, rich in gluten, from one of which the Revalenta Arabica food is prepared.

Throughout the animal kingdom those animals which live on vegetable substances are preyed upon by others, their flesh eaters. Among the races of mankind vegetable feeders are the least robust, energetic, and warlike; so, in the "struggle for life," the vegetarian must always go the wall.

**Composition and Scale of Diets.**—The following table is abridged from those in Parkes' "Hygiene," where may be found various tables calculated to show the proximate amount of the

alimentary principles in a subsistence diet, and the amount necessary to be added for each pound weight of an individual, and for every foot-ton of work performed, &c.:—

Ounces.	Sub- sistence Diet (Play- fair).	Rest Diet.	Standard Diet, Ordinary Work.	Soldiers' Ration, Home Service.	Propor- tion of Sub- stances in Sub- sistence Diet.
Albuminates - - -	2	2·5	4·31	3·95	100
Fats - - -	·5	1	3·53	1·35	82
Carbo-hydrates - - -	12	12	11·71	17·08	272
Salts - - -	·5	·5	1·70	·81	23
Total water-free food -	15·0	16·0	20·65	23·19	—

Subsistence diet, as stated here, is the basis upon which all scales of diet are built up; the component parts are given in ounces, avoirdupois, calculated on theoretically water-free constituents.

Subsistence diet is estimated as merely sufficient to carry on the functions of the body and to sustain life in a state of absolute repose—to keep body and soul together. To subsist after this fashion a man will require about  $\frac{1}{10}$ th of an ounce of water-free food for each pound weight of his body, or, say,  $\frac{1}{60}$ th of his weight in ordinary food, as a daily allowance.

To water-free substances, in order to represent so-called solid food such as we consume daily, an allowance for water must be added. Of course there is more water in some foods than in others; hence the necessity in scientific research for regarding all food as absolutely water-free. For instance, 10 ozs. of bread will contain 6 ozs. water; 1 lb. beef, 12 ozs., and so on. Vegetables contain 2 ozs. solids and 14 ozs. of water to the pound.

“Assuming the water-free food to be 23 ozs., and a man’s weight to be 150 lbs., each pound weight of the body receives in twenty-four hours 0·15 oz., or the whole body receives nearly  $\frac{1}{10}$ th part of its own weight.

“This is dry food, but a certain amount of water, between 50 and 60 per cent. usually, is contained in ordinary food; and adding this to the water-free solids, the total daily amount of so-called dry food, exclusive of liquids, is about 48 to 60 ozs. (23 + 50 per cent. = 34·5 ozs.; add to this the water-free solids in an ordinary diet, as shown in above table, 20·65 ozs. = 55·15 ozs.)

“In addition to this, from 50 to 80 ozs. of water are taken in some liquid form, making a total supply of water of 70 to 90 ozs., or on an average 0·5 oz. for each pound weight of body.”—*Parkes*.



Generally speaking, for each 1 oz. of water-free food  $1\frac{1}{2}$  ozs. of water must be added to represent ordinary food. Thus, if the water-free ration of a soldier be 23 ozs., an addition of  $34\frac{1}{2}$  ozs. of water will be required, giving a total of 3 lbs.  $9\frac{1}{2}$  ozs.

The capacity of any alimentary material for heat production or force production depends on the amount of non-oxidised carbon and hydrogen it contains, and the mechanical energy occurring in a body is in proportion to the chemical action going on. The amount of physical labour performed is in direct relation to the amount of carbonic acid produced, both from the oxidation of nitrogenised and non-nitrogenised substances and all chemical action going on within the body, consequently it may be taken as an index of the amount of force expended.

In a lecture given by Professor de Chaumont, at Newcastle, on "The Food and Energy of Man," he said:—

"There are two or three ways in which we may approach the question, besides that of direct experiment. For instance, when the chemical changes go on in the body, the carbon is converted into carbonic acid, the greater part of which is given off from the lungs, just as smoke, etc., are given off from the chimney of a furnace. Now it has been ascertained that in a state of rest a man of 150 lbs. weight (10 st. 10 lbs.) gives off about  $15\frac{1}{4}$  cubic feet of carbonic acid every 24 hours. Now each cubic foot of carbonic acid is evidence of the expenditure of 160 foot-tons of energy, and  $15\frac{1}{4}$  multiplied by 160 gives us 2,440 foot-tons total energy per diem. Again, if we examine the temperature of the human body we find that it is normally  $98^{\circ}\cdot4$  Fahr., whereas the average of the air is not above  $50^{\circ}$  Fahr.; indeed, here in Newcastle it is lower than that—about  $48^{\circ}$  I think. Let us take the difference, however, at  $48^{\circ}$  Fahr., and suppose that the 150 lbs. of a man's body absorbs heat in the same ratio as water—and it actually does contain 90 lbs. of water—we shall find  $150 \times 48 \times 775 \div 2,240 = 2,481$  foot-tons of energy expended, a difference of only 41 foot-tons from the calculation by the carbonic acid, or less than two per cent. If, now, we turn to the food calculated by Playfair, we find the following amounts of potential energy:—

Albuminates,  $2\cdot5 \times 173 = 432$ ; fat,  $1 \times 378 = 378$ ; and

Carbo-hydrates,  $12 \times 138 = 1,656$ , total 2,466 foot-tons.

"The correspondence between these three numbers is remarkable, and, even allowing for error, it goes far to prove the accuracy of Playfair's induction."

In works on food and dietetics may be found tables showing an easy means of calculating the quantity of water, albuminates, fats, carbo-hydrates, and salts in different articles of food. For example, suppose the constituents of uncooked meat of the kind supplied to soldiers are known to be in 100 parts—water, 75; albuminates, including the gelatine of the meat, 15; fat, 8·4; salts, 1·6. To find out the proportion of each of these articles in a ration of  $\frac{3}{4}$  lb. of meat: The mode of using such

tables is very simple; "the quantity of uncooked meat or bread being known, and it being assumed or proved that there is no loss in cooking, a rule of three at once brings out the proportions: Thus the ration allowance of meat for soldiers being 12 ozs., 2·4 or 20 per cent. is deducted for bone, as the soldier does not get the best parts. The quantity in the beginning, 9·6 ozs., will be  $\frac{75 \times 9 \cdot 6}{100} = 7 \cdot 2$ , and the water-free solids will be 2·4 ozs."—*Parkes*.

The amount of water in this 9·6 of so called dry food is here taken as 50 per cent., which is deducted to obtain the water-free solids,  $\frac{50 \times 9 \cdot 6}{100} = 4 \cdot 8 - 7 \cdot 2 = 2 \cdot 4$  ozs. The albumen taken from the table as fifteen  $\frac{15 \times 9 \cdot 6}{100} = 1 \cdot 44$  ozs., and so on with the fat and salts as above, their quantities will be ·8064 and ·1536 ozs. respectively.

**Composition of Rations.**—With respect to the statement that the soldier does not get the best parts of meat, see page 239 for the conditions of the Government contract. The standard daily diet is stated to contain in grains 317 nitrogen, 4,750 carbon, 202 hydrogen, 24 sulphur, and 461 salts. The proportion of nitrogen to carbon in a diet should be as 1 to 15, but the proportion of nitrogen must be increased in a higher ratio to meet the demands of any greatly increased energy of function. In a diet such as the standard diet there would be about 300 grs. of nitrogen and 4,600 grs. of carbon. On account of the inordinate demands on the physical powers of a soldier during war, the proportion of nitrogen in his ration must be increased (p. 252). The nutritive value of a war ration given by Parkes is stated at about 380 grs. of nitrogen and 5,000 grs. of carbon; here the proportion of nitrogen is increased to about as 1 to 13.

The total amount of water-free food consumed daily by the British soldier is estimated by Parkes as equal to 23·19 ozs.

"This is calculated as representing, nitrogen, 272 grs.; carbon, 4,588 grs., of which only 454 grs. is supplied by fat; hydrogen, 116 grs.; sulphur from albuminates, 32 grs."

"The quantity of nitrogen is considerably below that of the standard diet, while the amount of carbon is nearly correct, only this is given chiefly in the form of carbo-hydrates, and not as fat. The diet would be improved by the addition of more meat, or of cheese, and by the addition of butter or oil. So also, while fresh succulent vegetables are sufficient, the use of peas and beans, as in the French army, would be very desirable."

Some authorities on dietetics adopt the weight of 140 lbs., and others even 150 lbs., as the average weight of the body referred to in their calculations as to the amount of food necessary for a man. But an estimate framed upon such a basis would be

rather too high for the rank and file of the army, as the army medical reports show that more than half the recruits passed into the service during the last seven years were under 130 lbs. Of course some allowance in weight will have to be made on account of the subsequent growth of the recruit, but, on the other hand, these lads are reputed to be the chief non-productive consumers of produce in the service.

**Economy in Food.**—With respect to the economical use of food, Pavy makes the following practical deductions. His figures are slightly different from those given by Parkes:—

“Let it be assumed then that 300 grs. of nitrogen and 4,800 grs. of carbon are daily required. I will proceed to show, after the manner adopted by Payne, in what way these elements are most economically, or with the least waste of material, supplied. The ratio of the quantities named is as 1 to 16, which implies that 16 times as much carbon is required as nitrogen. In albumen the ratio, on the other hand, is about as 1 to 3·5. Hence, if albumen alone were supplied in furnishing the 300 grs. of nitrogen, there would only be 1,050 instead of 4,800 grs. in associated carbon; and conversely, if the 4,800 grs. of carbon were supplied, there would be 1,371 grs. of accompanying nitrogen, or rather more than four and a half times the amount required. In bread, following Payne’s analysis, the ratio of nitrogen to carbon is as 1 to 30. The amount of bread, therefore, that would yield 300 grs. of nitrogen would contain 30 times the quantity, or 9,000 grs. of carbon; that is nearly double the amount required; and should an amount of bread be consumed that would just suffice to yield the 4,800 grs. of carbon, 160 grs., or only rather more than half the quantity of nitrogen required, would be supplied.

“From these considerations it follows that neither bread nor albumen is adapted for economically furnishing what is wanted, and what is true concerning these articles is equally so of others containing a preponderance of either carbon or nitrogen. It is upon a due adjustment of the two that the principle of adjustment is founded; and as nitrogenous principles preponderate in animal food and the carbonaceous or non-nitrogenous in vegetable, we see that the teachings of science harmonise with the instructive propensity which inclines man so universally to the employment of a mixed diet.”

No diet can be so adjusted as to meet the requirements of every particular case under the varying external and internal condition to which the body is liable. Even taken in connection with a normal state of the body, doing a moderate amount of work in a model atmosphere, the expression “standard diet” must not be valued at more than what it is really worth. In regulating a dietary the physiological question must ever be united with the chemical one. Theoretically the force produced by the oxidation of an ounce of albumen within the body equals 173 tons

lifted one foot, but practically, independent of its constructive and conservative action, its quality as a force producer is not above that of a carbo-hydrate. For obvious reasons connected with nutrition and an individual's power to digest and assimilate food, the expression potential energy does not refer to more than the inherent scientific value of the food itself, independent of its suitability and physical conditions. If the physical condition of food is altered by compression and abstraction of the water natural to its composition, it loses in nutritive value, and this cannot be restored by the addition of water. Consequently the tabulated value of foods of different natures, or even of the same class of substances, showing the actual energy obtainable by oxidation of any one out of the body, when referred to what takes place within the body, is rather of a speculative character, and is of itself of but little real practical value, especially in the treatment of disease when the system is in an abnormal condition. Still a knowledge of what can be got out of food, and by what food the required principle of action is held, are as absolutely necessary as a knowledge of its mode of liberation and the direction in which it can alone exercise its influences on vital activity.

During illness the best scientific guide as to the administration of nitrogenised food is in the reaction of the urine. In the Appendix of the Army Medical Regulations will be found excellent tables calculated to give all necessary information as to the potential energy and nutritive value of the diets employed in our military hospitals.

**Man's Capability for Work.**—In drawing a comparison between a man and a steam engine as to their relative capacities for performing external work in proportion to oxidisable substances consumed, the human machine has been estimated as turning out one-fifth and the engine only one-tenth of the force liberated. However, this is scarcely a fair proportion, as it is probable a man is only able to give out one-eighth of the dynamic power of his food, while the economical production of force by steam engines has been greatly increased during recent years, and is now stated as one-fifth.

The consumption of fuel in an engine varies as to the cube of the velocity, but science has not yet ascertained with respect to the human machine the exact relation. Still its existence is recognised and generally accepted under the designation of "the pace that kills." It is said that a horse moving at a walk can for 10 hours exert a force twice as great as it can when moving at a trot for half that time. Marching at a rate of three miles an hour is the pace which gives the best result for the expenditure of muscular force.

Parkes says—"The external work which can be done by a man daily has been estimated at one-seventh of the work of the



horse; but if the work of a horse is considered to be equal to the one-horse power of a steam engine (viz., 33,000 lbs. raised one foot high per minute, or 8,839 tons raised one foot high in ten hours), this must be an over estimate, as one-seventh of this would be 1,263 tons raised one foot in a day's work of ten hours. . . . An amount of work equal to 500 tons lifted a foot is an extremely hard day's work, which perhaps few men could continue to do; 400 tons lifted a foot is a hard day's work, and 300 tons lifted a foot is an average day's work for a healthy strong adult. . . . Adopting a mean number of 260 tons for all the internal mechanical work, and the external work of a mechanic being 300 to 500 tons, this will amount to from one-seventh to one-eighth of all the force obtained from the food.

**Energy, as the Term is Applied in Artillery,** is generally used to express the "stored-up work" of a projectile when it strikes an object, and it is on the "vis viva" of a body in motion that its power of penetrating armour plates depends.

The whole mechanical effect of work until the body is brought to a state of rest (of course without regard to the time occupied) varies as to the weight of the projectile multiplied by the square of its velocity at the time of impact, divided by twice the force of gravity. It is simply calculated thus:—

$$\frac{W V^2}{2 g} = \text{energy in foot pounds.}$$
 $W = \text{weight of projectile in pounds.}$ 
 $V = \text{velocity remaining at time of striking in feet per second.}$ 
 $G = \text{accelerating forces of gravity.}$

Suppose a projectile from a 35 ton gun of 700 lbs. weight to be travelling at the rate of 1,000 ft per second, what could be its energy,  $700 \times 1,000 \times 1,000$  and divided by twice 32.2 or 64.4 = 10,869,563 lbs. divided by 2,240 foot-tons = equals in round numbers 4,853 tons or foot-tons. Thus a projectile striking with a velocity of 1,000 ft. before its life was expended, would do work sufficient to raise 4,853 tons one foot from the ground; in other words the energy stored up in a shot moving at the above velocity is capable of lifting this weight against gravity one foot high.

**Meat Supply for Troops.**—Strictly speaking it is no portion of the ordinary or routine duties of a M.O. to examine cattle as to the state of their health, still he may be called upon at any time to do so as a matter relating to the health of the troops, and not necessarily in connection with the supply of their food, for diseased animals may communicate infection to human beings otherwise than by reason of their flesh being used as food. See **Food Supply in the Field**, p. 258.

It is not difficult to know when an animal is sick, but to diagnose the disease for one who has not studied the subject, and who is without practical experience in the matter, is by no means as easy as it might appear to be.

The diseases of live stock in their relation to the public supplies of meat is summarised in the following manner by Dr. C. B. Fox, from the Public Health Report of Medical Officer of Privy Council, No. 5, 1862:—

**1. Contagious Fevers. 2. Anthracic and Anthracoid Diseases. 3. Parasitic Diseases.**

1. “*Contagious Fevers*.—(a) epidemic pleuro-pneumonia, or lung fever, principally found in horned cattle; (b) apthous fever, or foot-and-mouth disease (murrain), which affects horned cattle, sheep, and swine; (c) small-pox of sheep (variola ovina); (d) cattle plague (rinderpest, typhus, contagious).

2. “*Anthracic and Anthracoid Diseases*.—They prevail as epidemic diseases localised in particular sections of the country, and are known as (a) splenic fever, or apoplexy of horned cattle and sheep; (b) the braxy of sheep = splenic apoplexy; (c) the black quarter, or black leg, of horned cattle and sheep; (d) the gloss anthrax, or tongue carbuncle, of almost exclusively horned cattle; (e) the forms of anthrax which affect the mouth, pharynx and neck in swine; (f) the apoplexy of swine and their so called blue-sickness or hog-cholera; (g) the parturition fever of cows, etc.

3. “*Parasitic Diseases*, such as “measles” of the pig, the various chiefly visceral diseases of stock which depend on larvæ of the *tænia marginata* and *tænia echinococcus*, the “rot” of sheep; the lung disease in calves and lambs, and the easily overlooked, but highly important, disease of swine, which consists of an infection of the muscular system by the minute immature forms of the *trichina*.”

A question concerning food supply requiring a medical opinion may arise at any moment. The condition of the animal will bear a direct relation to the wholesome quality of its flesh. Theoretically an animal ought to be in perfect health when slaughtered, but practically it is not necessary that it should be so; although the flesh of diseased cattle is not desirable as food, nevertheless some diseases must be regarded as not materially affecting the flesh, which might still be retained as good, wholesome, and fit for issue. Simple inflammatory affections, or some distempers in their earlier stage, or bronchitis, or pneumonia, do not render meat unwholesome, neither does a feverish state of the animal brought on from being over-driven. On the other hand, there are diseases or distempers which render the flesh not only unwholesome but positively dangerous.

*Foot-and-Mouth Disease*.—A specific eruptive fever causing ulcers in the mouth, on the teats, and above the hoofs. Like eruptive fevers in the human subject, it runs a definite course; it is seldom fatal. The flesh of animals thus affected is of a pale colour, flabby, and moist. There is no evidence to show that the flesh is injurious; milk from cows affected with this disease causes sore mouths in children.



*Cattle Plague.*—This renders the flesh of a dark grumous colour in the advanced stage of the disease, but otherwise the meat is unaltered in its healthy appearance. Evidence of the disease may be found in the air passages, and ulcers resembling those observed in typhoid fever occur in the intestines. Although the flesh might be considered highly dangerous, there is strong evidence to the contrary when properly cooked.

*Black Quarter or Anthrax.*—Fever of a low form, accompanied by boils and carbuncles, and erysipelatous swelling of the limb are characteristic of the disease. The part where the disease is localised in the flesh is black. The stage of the disease, the parts eaten, the time the meat was kept, and the mode of cooking may account for the discrepancy in evidence relative to this and other diseased meats. All meat from anthracic diseased cattle should be condemned; it is said to produce malignant pustule.

*Small-Pox* in sheep is easily known by the flexible appearance of the skin, loss of wool in patches, and the rapid occurrence of nodules or papules, vesicles and pustules. The flesh is of a peculiar nauseous smell, pale and moist. It produces sickness and diarrhoea and sometimes fever. This is stated to be the most injurious of all diseased meat.

*Braxy*, probably a description of anthracic disease, kills a great many sheep in Scotland; it is easily known by the staggering gait, bloodshot eyes, and fever. The flesh after being well pickled and hung is eaten. Dr. Smith states that “the shepherds in the Highlands of Scotland eat by preference braxy mutton.” He may be mistaken as to “preference,” as according to other authorities it is said to kill dogs.

An experiment by Dr. Davies goes to show that the poisonous properties of diseased meat are not necessarily destroyed by cooking; he successfully vaccinated with lymph which had been buried in a leg of mutton whilst roasting. However, this only proves that the vaccine virus after exposure to heat for a certain time retains its properties. A poison thus preserved and directly introduced into the blood, differs from a diffused and diluted poison which will have to be digested and assimilated before absorption.

Mr. Simon, in the report already alluded to, gives the following digest of Mr. J. Gamgee's investigation, made at the request of the Government:—

“Horned cattle affected with pleuro-pneumonia are much oftener than not slaughtered on account of the disease, and when slaughtered are commonly (except their lungs) eaten, and this, even though the lung disease has made such progress as notably to taint the carcase; that animals affected with foot-and-mouth disease are not often slaughtered on account of it, but if slaughtered, are uniformly eaten; that animals affected with anthracic and anthracoid diseases, especially swine and horned

cattle, are (except their gangrenous parts) very extensively eaten ; that the presence of parasites on the flesh of an animal never influences the owner against selling it for food ; that carcasses too obviously ill-conditioned for exposure in the butcher's shop are abundantly sent to the sausage-makers, or sometimes pickled and dried ; that specially diseased organs will often, perhaps commonly, be thrown aside, but that some sausage-makers will utilise even the most diseased organs which can be furnished them ; that the principal alternative, on a large scale, to the above-mentioned human consumption of diseased carcasses is that, in connection with some slaughtering establishments, swine (destined themselves presently to become human food) are habitually fed on the offal and scavenger of the shambles, and devour, often raw and with other abominable filth, such diseased organs as are below the sausage-maker's standard of usefulness."

Meat undergoing decomposition is positively injurious. See p. 85.

Meat may be hurtful by reason of the animal having fed on poisonous plants or from having been drugged, in which case the fat after cooking is said to have a peculiar bitter taste. In case of suspected poisoning by antimony, arsenic, or strychnine, a good plan is to give some to a cat or dog and watch the effect ; or the butcher who sells it might be made to eat a ration, in which case you may have to appear before the coroner, not professionally.

**Army Contracts, how Arranged.**—All supplies and services on the public account which may be authorised to be obtained or executed locally are provided for by contract by the G.O.C.

*Tenders* must be accompanied by a letter signed by two securities for the due fulfilment of the contract. Tenders are opened by a staff officer in the presence of an officer A.S.C. in the case of general supplies, of an officer of the R.E. department on services relating to this department, of an officer of the O.S. department for ordnance store or clothing services, and of a M.O. in case of hospital supplies. In this latter case the recommendation for acceptance will be made with the concurrence of the S.M.O. expressed in writing.

The opening of tenders and all necessary inquiries into the character of persons tendering and their securities are considered of a confidential character.

The lowest tender must be recommended for acceptance unless there be any special reason for its rejection. The Director of Contracts is the approving officer.

**Contracts for Meat.**—In the Official Manual for Commissariat Officers it says in England oxen in good condition should weigh not less than 600 lbs. Fat beasts sometimes weigh as much as 1,200 lbs. Heifers and cows should weigh 350 to 700 lbs. Sheep 60 to 90 lbs. Yet it may be seen these are not conditions of the contract.



The proportion of dead meat fit for issue is about 50 per cent. of the gross weight of the animal. Parkes says, oxen and sheep ought to yield 60 per cent., so the supply estimate is considerably below his in favour of the soldier.

The following is stated as the trade rule for estimating the produce of live stock:—Oxen, find live weight, strike off one-third, then strike off 5 lbs. for every score; sheep, find live weight, strike off one-third, then strike off 7 lbs.

The age of an ox is judged by the teeth and marking on horns, one being for each year. The age of a sheep by the teeth, of which there are eight in front, as in the ox. The first teeth are called sucking or milk teeth, and are all sufficiently developed by the sixth week to enable the animal to graze. At 12 months two are shed from the centre, and are replaced within 6 months by two permanent ones, and so on each 6 months until the animal is about  $3\frac{1}{2}$  years old, when it will have a full mouth of permanent teeth. The breeder's rough rule is, two broad or permanent teeth every year. As age increases the teeth become narrower and more flattened on the top, the colour yellow and dark, and the spaces between them widened. Often animals will be found with some teeth shed. Sheep fat for slaughter ought to have a clean even set of teeth. The contract orders that those with broken teeth shall be rejected.

**Conditions of Contract.**—Some conditions of the usual contracts made for the supply of meat to troops in the United Kingdom. It is very necessary that these conditions should be known to all officers who have to inspect and receive meat from contractors on behalf of their men, otherwise they cannot know what they are entitled to receive:—

**Quality of Meat.**—The meat shall be well fed, good, sound, sweet, and wholesome. The beef shall be ox, not under two nor more than eight years old; or heifer and cow, not under two nor more than four years (48 months) old; the mutton, wether or ewe. Carcases of sheep weighing more than 80 lbs. will not be received unless the contractor consents to remove the surplus fat. All meat imported in a frozen state must be thoroughly thawed prior to delivery.

Mutton will not be demanded for more than one day a week, and beef shall, if required, be supplied upon the remaining six days.

The meat for hospitals shall be hung for such period as the authorised officer may consider necessary, and shall be supplied in such joints or portions (beef or mutton) as may be demanded. The beef for tea to be free from fat and bone. The beef-steaks to be tender, trimmed, and free from bone and unnecessary fat. The mutton chops to be trimmed, and free from unnecessary fat and bone. The meat for prisons shall be supplied in such quantities of beef, mutton, or salt pork, as may be demanded, and of the same quality as that supplied for rations.

**Mode of Delivery.**—The meat shall be delivered at the contractor's expense, at such times and places as the senior commissariat officer, or other officer acting on his behalf, shall from time to time direct, and in the following manner, namely:—

The ration beef in quarters, the fore and hind quarters alternately (the bone from 4 in. above the knee and upper hock joint to be excluded); and the ration mutton in carcasses (excluding heads and shanks below the knee and hock joints). When the kidneys are removed from the carcasses of mutton or the quarters of beef, and are not supplied as portions thereof, the kidney-suet is also to be excluded.

The meat for hospitals and prisons shall be delivered into the stores at the hospital or military prison as directed.

The ration meat, when passed by the board, will be cut up, divided, and weighed by the contractor—who will, if required, provide scales and weights for the purpose, when they are not furnished by the department—when directed, in such proportions as shall be required for the convenience of corps or detachments, and issued in the quantities stated in the Ration Returns. When the meat is cut up by the troops, an additional weight of one per cent. shall be allowed by the contractor, to cover losses of cutting up.

**Inspection of Stores, &c.**—The senior commissariat officer or his delegate, and, at stations where there is no officer of the Commissariat Department, the officer in command, or such officer as he may appoint, shall have access at all reasonable hours to the premises where the meat is in course of preparation, and where the live cattle and sheep are kept in reserve, and the contractor shall immediately remove any animal, dead or alive, which the said inspecting officer shall object to as not being of the quality or kind stipulated for in these conditions, and the inspecting officer shall also have the power of replacing by purchase any meat, sheep, or cattle so rejected by him. Should the contractor feel aggrieved, he shall be entitled to appeal to a board of officers. The contractor or his agent may be present at such board, if he think fit. In case the contractor, his agents, or servants, shall afterwards offer any of the rejected cattle or sheep for the use of Her Majesty's troops, the contractor shall for every such offence forfeit the sum of 50*l.* for every head of cattle so offered, and 10*l.* for every sheep so offered, to be deducted from any sum due to him under this or any other contract.

**Inspection.**—All meat offered by the contractor shall be subject to the inspection and approval of a board of officers, except that for hospitals and prisons, which will be inspected by an officer appointed to the duty; and any meat rejected as not being in accordance with the conditions of contract, shall be immediately removed by the contractor, and the senior commissariat officer shall be at liberty to purchase meat in lieu of

that rejected, or to require the contractor to replace it by meat of unobjectionable quality. Any expense incurred by such purchase shall be defrayed by the contractor in the same manner as in the case of purchases in default.

**Special Boards of Survey.**—The O.C. at any station may, further, whenever he may deem fit, appoint a *garrison* board to inspect the ration meat, and in cases where it may be impracticable to assemble a garrison board, a regimental board may be held with equal power. If the board shall be of opinion that the supplies are not of the quality specified in these conditions, they shall be rejected. See sec. 23 A.A., p. 34.

A defect in the conditions here stated, which has only recently been introduced, is the admission of frozen meat. The market value of frozen mutton by the carcass is about  $1\frac{1}{2}d.$  a pound, while the agreement according to contract may be  $5d.$  a pound. Frozen meat, although its inherent scientific or chemical value may represent a fair standard quality, is deficient in aroma, is not palatable, and seems to be deprived of many nutritive and sustaining qualities possessed by fresh meat. This recent alteration in the conditions is not in the interests of the soldier; a loophole is left by which the contractor escapes his obligation of supplying home-fed mutton, and he naturally profits thereby.

Since this was written I see the Committee on Soldiers' Dietary recommend whenever frozen meat is supplied that 10 per cent. be added to the issue "on account of the waste that occurs in the process of cooking it."

Parkes says, animals should be inspected 24 hours before being killed and meat 24 hours after. If the animals were again inspected at the time of slaughter and the meat at the time of issue there would be less chance of substitution.

The contractor is responsible for the condition of the meat until issued, notwithstanding it may have been previously passed by a *Board of Survey*. If from any cause a board cannot be assembled, and the contractor objects to the grounds upon which the meat tendered by him has not been accepted, he can appeal to the judgment of three respectable persons nominated by himself and by the C.O. Fresh meat when transported to any distance should be packed in straw and air allowed to circulate round it. In camp, meat for the following day should be killed as soon as the men march in, and issued to corps in bulk for distribution.

**Beef.**—In the Official Instructions to Military Cooks it is stated—"Ox and heifer beef is the best, and the first is the largest and richest, but the latter is the best if well fed."

"The lean should have an open grain of a bright red colour, with delicate veins of fat running through it, the fat white rather than yellow, and the bark smooth. Good beef should not become moist when kept. Some first-class meat will have a

yellow fat, from being fed on oilcake, but the flesh should not be flabby; meat thus fed will in general waste greatly in cooking.

"Second-class beef is generally cow beef and old ox beef. Cow beef is closer in the grain, and the meat is not so firm as ox beef; the lean is paler and the fat whiter. If young, the fleshy part, on being pressed with the finger, will leave no dent, but rise up again soon after. If old ox beef the meat will be rough and spongy, and the bark rough. In old meat there is a streak of horn, or bone, called the crush-bone in the ribs of beef; the harder this is the older the meat, and the flesh is not so finely flavoured, but it gives a good strong soup and requires longer boiling.

"The third class is very old cow beef or bull beef; the grain is closer still, of a deep dusky red, tough when it is pricked; the fat is skinny, hard, and has a rankish smell. If it be bruised these places will look a more dusky or deep red brick colour than the rest. The best mode of judging of beef when killed and dressed is by the tongue; if it is clear, plump and bright, with the fat at the end of a pinkish white, the meat will be good; but if it should be dark, and the fat a dead white, the meat will be hard and flavourless."

The same remarks apply to sheep.

**Mutton.**—To be a judge of good mutton requires great experience. So much depends on the breed of the sheep.

"Each breed has, of course, its first, second, and third qualities, but each differs in appearance as much as it is possible to do; for instance, an old Leicester or Dishley sheep will look fine, fat and plump, with the fat on the back like bacon, but it will eat rank and hard; whereas a Welsh sheep will look thin, dry and hard, but will eat short, mellow, and of the finest flavour. In respect to sheep, the cook is a better judge of their eating qualities than the butcher; the latter knows the various qualities of the Leicester and Southdown, and how they will turn out in regard to profit to himself; but other breeds, unless he is on or from the locality, he is ignorant of.

"*The first quality* of every breed is the wether, the bones of which should be small, the flesh clear dark red, and the fat firm and white.

"*The second quality* is ewe mutton; the flesh is paler and the grain closer, the fat spongy.

"*The third class* is ram mutton, and diseased wether and ewe mutton. The former is known by the flesh being close grained and tough, and not rising again when dented by the finger, of a dark brickdust red, and the fat is spongy; the smell and flavour is strong. In the latter the flesh will be pale, the fat faint white, inclining to yellow, and the flesh will be loose at the bones. If it has had the 'rot,' the fat will be yellow, and the flesh flabby



and moist, the fat round the kidneys spotted; and, if the flesh is squeezed hard, some drops of water will stand on it like sweat."

*To assist in judging meat* pass a knife into it and apply it to the nose on withdrawal. A knife should pass through muscle with a uniform amount of resistance. If a piece of meat is chopped up and boiling water poured on it, its odour is readily determined. Good meat is acid and should redden litmus paper. The condition of the fat and marrow should be observed, and the internal organs if necessary should be seen. The intestines, stomach, and lungs, also the loin, should be inspected for abscess or parasitic disease. Parkes says—"In temperate climates the marrow of the hind legs is solid 24 hours after killing; it is of a light rosy red. If it is soft, brownish, or with pink points, the animal has been sick, or putrefaction is commencing. The marrow of the fore legs is more diffuent, something like honey, of a light rosy red."

The proof of the pudding is said to be in the eating, and the same may be said of meat; it should be practically tested by cooking. Meat apparently of good quality may be hard, tough, and tasteless; this condition is mostly found at foreign stations, in India for instance. Suppose it took four and a half hours, physiological time, to digest a British beef-steak, it would undoubtedly require five and a half hours to digest the fleshy fibre of a Bengal bullock, perhaps more, when digestive activity is impaired by climate, assisted perchance by over-indulgence in rum, beer and tobacco.

According to the contract, it may be seen that the cattle and sheep are inspected by an O.-in-C.-S.; they are sometimes also inspected by a veterinary surgeon. After the meat is passed by the O.-in-C.-S., it is again inspected in bulk and passed by a board of officers. When meat is objected to by the troops, and a further board is assembled, a M.O. attends, and states his opinion in writing, if necessary to be attached to the proceedings. In performing this duty it is necessary to bear in mind the conditions of the contract here given, and the arrangements by which it is carried out under the observation of the supply service, passed and issued immediately under Government direction and control; also consider to what the soldier is entitled. Once issued to the troops, the O.-in-C.-S. is naturally interested, after he passed it as fit for issue and up to contract, that it should not be condemned by a board; however, the Committee on Soldiers' Dietary say—"At small stations where there are no A.S.C. establishments, and dead meat is supplied to regiments, complaints are not unfrequent as to the quality of the meat." This tends to show that if the victualling of the men were exclusively a regimental affair they would not be as well served as they are at present; no doubt if it were so, the cupidity of local contractors and intra-regimental harpies would be stimulated to profit unduly by such transactions.

A class of instruction of selected officers was instituted recently at the Metropolitan Meat Market, under the M.O. of Health for the city of London ; some of these officers are now appointed travelling inspectors "of rations supplied under contract." Should similar duties be required in civil life, M.Os. would be appointed to perform them. After all, whenever the men in barracks are insufficiently fed, it is regimental administration and supervision that are defective, and not the fault of the Government issue, as one might be led to suppose.

Parkes says—"In cutting up meat there is a loss of about five per cent., and there is also a loss from bone, so that all deductions having been made, the soldier does not get more than 5 or 6 ozs. of cooked meat out of the 12 ozs." This seems rather a low estimate. Look at the conditions of contract; some bones are not included in the issue, and an allowance is made for cutting up of one per cent. In beef the legs are directed to be cut off four inches above the knee joints and upper hock joints, and if the latter are left in for the convenience of hanging the quarters, from one to one and a half per cent. should be allowed for them in issuing. In mutton the shanks are cut off below the knee and hock joints. Again, with respect to the cooks keeping back the dripping from the men, military cooks know it is a very serious crime to make away with any article of food with which they are entrusted, and the plea of looking upon dripping or fat as a perquisite would not hold as good here as it generally does in civil life. See **Extra Messing**, p. 286.

Compared with foreign armies, the meat barrack ration of the British soldier shows up well. Taking fresh meat in ounces—England, 12; France, 10·58; Germany, here there are two rations, a peace ration, 3·80, and war ration, 8·81; Austria, 9·87; Italy 6·34; Russia, 7·05; Turkey, 9·06; America, U.S., 1½ lbs.; our war ration is 1½ lbs. See p. 251.

**Salt Meat.**—"It is not at all easy to judge of salt meat, and the test of cooking must often be employed. The following points should be attended to:—

- (a.) *The salting has been well done, but the parts inferior.*—This is at once detected by taking out a good number of pieces; those at the bottom of the cask should be looked at, as well as those at the top.
- (b.) *The salting well done, and the parts good, but the meat old.*—Here the extreme hardness and toughness, and shrivelling of the meat, must guide us. It would be desirable to have the year of salting placed on the cask of salt beef or pork.
- (c.) *The salting well done, but the meat bad.*—If the meat has partially putrefied, no salting will entirely remove its softness; although there may be no putrefactive odour, or greenish colour. A slight amount of decomposition is arrested by the salt, and is probably undetectable.

Cysticerci are not killed by salting, and can be detected. Measly pigs are said to salt badly, but Mr. Gamgee informs me this is not the case.

- (d.) *The salting badly done, either from haste or bad brine.*—In both cases signs of putrefaction can be detected; the meat is paler than it should be; often slightly greenish in colour, and with a peculiar odour.

“It should be remembered that brine is sometimes poisonous; this occurs in cases where the brine has been used several times; a large quantity of animal substance passes into it, and appears to decompose. The special poisonous agent has not been isolated.”—*Parkes*.

The nutritive value of salt beef may be recorded as equal to two-thirds the quantity of fresh beef.

Vinegar or pickles should always be issued with salt meat, as is done on board ship. Salt meat takes a considerable time to prepare; if issued on the line of march it will cause thirst. In the cooking, the heat should be very slowly applied and long continued; a little vinegar added while cooking is said to soften the harder fibres.

If possible fresh vegetables of the cruciferous order—cabbage, turnips, etc.—should be used with it; they contain but little starch. *See p. 257.*

**Bread, Conditions of Contract—Quality.**—The bread shall be sweet, well-made, and properly baked, and be made from flour which is clean and free from grit, the produce of good, sound, sweet, and dry British or foreign wheat, in the proportion of one-third of *white*, to two-thirds of *red* wheat, without any adulteration whatever. The bread for rations and prisons to be of the quality known as “*Best Seconds*,” and that for hospitals to be of the quality known as “*Best Household*,” in the baking of which yeast, not leaven, shall be used. The bread for prisons to be delivered not earlier than 36 hours after it has been baked.

**Mode of Delivery.**—The ration bread shall be delivered by the contractor, and at his expense, at such times and places as the senior commissariat officer, or other authorised officer shall direct, and shall always at the time of issue have been baked not less than 24 hours, nor more than 48 hours, in loaves weighing at the time of issue to the troops four pounds each; the contractor shall, if required, weigh the bread at the time of issue to the troops, providing for that purpose scales and weights when they are not furnished by the Government.

The bread for hospitals and prisons shall be delivered into the stores at the hospital or military prison as directed.

**Extra Bread.**—The contractor for ration bread is to furnish in addition to the established ration, such bread as may be required, not exceeding half-a-pound per diem for each warrant officer, N.C.O. and soldier, and the same will be paid

for monthly by the paymaster of the regiment or corps. It shall not, however, be compulsory on C.Os. to have recourse to the contractor for this extra supply, but if once so drawn it must not be discontinued without a month's notice to the contractor to that effect, or till the removal of the corps from the station if within the month.

**Analysis.**—The O.C. the station, or the senior commissariat officer, or other person appointed by either of them, shall be at liberty to select from time to time a sample of flour or a loaf from the bread prepared for the use of the troops, which shall then and there be sealed and transmitted to the War Office chemist at Woolwich, or such other authorised analyst as the Secretary of State for War may select, for examination, and the report of the War Office chemist or other analyst shall be taken as conclusive evidence of the contents of the bread or flour.

Similar conditions are required under this contract with respect to the inspection of bakeries, flour, bread, boards of survey, purchasing in default, etc., as in the case of a meat contract. So it is also with respect to the contract for hospital supplies and groceries, subject to the conditions stated. *See p. 34.*

**Purchasing in Default.**—If the contractor fail to deliver the bread, the O.-in-C.-S. will be at liberty to purchase elsewhere, or issue biscuit from his store,  $\frac{3}{4}$  lb. biscuit as a substitute for 1 lb. of bread. It is worthy of note that whenever bread or meat are purchased for the troops in default of contract, the actual expense will be allowed, provided the quantity purchased does not exceed the authorised ration. But if articles purchased do not form part of the authorised ration, the cost must not exceed the value according to contract rates of the supplies condemned.

The committee recently appointed to inquire into the question of the soldiers' food, recommended that the ration bread should be made of the same sort of flour as the hospital bread, and baked in 2-lb. loaves instead of 4-lb. loaves as at present. This improvement in the bread ration is estimated to cost 11,200*l.* increase in expenditure.

**Bread Making.**—The subject of bread making is very thoroughly gone into in the Official Manual for Commissariat Officers. The wheat of commerce is divided into two great heads—winter and spring; and these again by their colour into white and red. A fair standard weight for wheat is 63 lbs. to the bushel. Weight is affected by moisture in the atmosphere. Wheat should never be ground until it has been "housed" from three to six months. Old wheat produces the best quality and largest quantity of bread. Intermediate or semi-hard is generally the best for commissariat use as containing less water; it keeps better, and yet possesses the quality that makes good bread. When ground into flour 100 lbs. of soft white wheat will give fine white household flour about 74 lbs.; second flour or parings, 8 lbs.; bran, etc., 16 lbs.; loss in grinding and sifting, 2 lbs.



The bran from soft wheat is sometimes left in the flour, when it is called "whole wheat flour," but the bread made from it has a tendency to produce diarrhœa, unless the bran has been sifted out and ground by itself very fine and again mixed with the flour. It cannot be made fine enough when mingled with the flour, because the extra grinding necessary will render the flour itself too fine. If wheat is ground too fine, a greater bulk of flour is produced, but at the expense of its quality for making bread. "When hard or red wheat is ground into flour the outer envelope comes off in minute particles instead of flakes, that cannot be sifted out, producing a darker or seconds flour. There will be 80 lbs. of this flour from 100 lbs. of wheat, and proportionately less parings and bran."

At home the conditions of contract lay down that hospital bread be made from white household flour, but ration bread from one-third white and two-thirds red wheat flour, or what is called in the trade "London, No. 2," of a quality to produce 92 4-lb. loaves from a sack of 280 lbs. of flour. In bread making one pint of yeast and from 2 to 3 lbs. of salt will be required for a sack of flour, and about 14 gallons of water for the sponge; about 15 ozs. of this is evaporated during fermentation and baking. In baking, good dough increases to double its bulk, but loses 3 ozs. in the 4-lb. loaf after leaving the oven. There will be a further loss by the time of issue, 24 hours, of 2 ozs. But allowing for these losses, 100 lbs. of flour ought to produce from 123 to 135 lbs. of bread. Parkes says—"The 4-lb. loaf in the first 24 hours loses  $1\frac{1}{4}$  ozs., in 48 hours 5 ozs.," and so on, but varying in accordance with the amount of crust, temperature and moisture in the air.

*Special Points about Making Bread.*—Bread may be of bad colour—rather yellowish from old flour, from grown flour (in which case the changes in the starch have generally gone on to a considerable extent, and the bread contains more sugar than usual, and does not rise well), and perhaps from bad yeast. The colour given by admixture of bran must not be confounded with yellowness of this kind.

Bread is also discoloured from admixture of other grains. The acidity of bread should not exceed eight grains per pound, reckoned as glacial acetic acid. Bread may be too acid from bad flour, giving rise to an excess of lactic acid, perhaps acetic acid; or the yeast may be bad. Potatoes also cause it to become acid. In finding the cause of acidity, see the flour, which may be old, discoloured, and too acid. Next look to the yeast; then the vessels in which the dough is kneaded; also the water and salt should be examined.

Bread is heavy and sodden from bad yeast fermenting too rapidly, or when the fermentation has not taken place (cold weather, bad water, or some other cause, will sometimes hinder it), or when the wheat has "grown;" when too little or too

much heat has been employed. It is said also that if the flour has been dried at too great a heat (above 200°), the gluten is altered and the bread does not rise. It may be bitter from bitter yeast.

Bread becomes mouldy rapidly when it contains an excess of water; rice and potato, when added, cause it to retain moisture.

At page 228 the chief adulteration of bread by alum is referred to. Terra alba or plaster of Paris and whiting are sometimes added to increase the weight. If the ash exceeds two per cent., the presence of mineral substances may be reasonably suspected. "There are several mills in the United States that grind white stone into powder, sold at half cent per pound, of three different degrees of coarseness — 'the soda grade, sugar grade, and flour grade' — for purposes of adulteration. The prompt action of the Russian Government, during the Russo-Turkish campaign, on discovering that the flour furnished by the head of the commissariat department contained a large percentage of terra alba, is to be commended. The man who endangered the success of the enterprise was immediately shot for his dishonesty." — *For.*

Sulphate of copper and sulphate of zinc are sometimes used on the continent to suspend fermentation in damaged flour, and in order to make the bread white. Lime water, if added, while it does not check the fermentation of the yeast, prevents the action of diastase on starch; but this advantage can only be got from lime water, and not by using chalk and water, as is sometimes done.

Troops on board ship get 12 ozs. of biscuit on three days in each week, and 1 lb. of bread on the other days.

In the Queen's Regulations may be found instructions for the preparation of bread for troops at sea.

Potatoes are forbidden to be used in making yeast. The victualling of transports is done by the Admiralty.

**Biscuit.** — Biscuit should be well baked, not burnt, of a light yellow colour, float on water, when struck give a ringing sound; a piece put in the mouth should thoroughly soften down. Weevils are easily seen.

*Advantages as a Diet.* — Biscuit contains little water, and bulk for bulk is more nutritive than bread;  $\frac{3}{4}$  lb. is reckoned as equivalent to 1 lb. of bread; it is easily transported; forwarded to the base of operations, it can be well preserved in the water tanks on board ship when they are not required for the voyage.

*Disadvantages.* — Like flour, it is deficient of fat; after a time it seems difficult of digestion. Men do not thrive well upon it for long periods. In war it has always been a rule with the best English army surgeons for more than a century to recommend the issue of bread as much as possible, and to use biscuit only in cases where it cannot be avoided. — (*Parkes*).

4 lbs. of flour will make about 5 lbs. of bread. When bread is made in Government bakeries, the average gain in the manufacture is stated at from 30 to 40 per cent., and the loss in the making of biscuit about 10 per cent.

M.Os. are frequently called upon to give an opinion as to the quality of bread tendered for issue to the troops. It will be seen by the conditions of the contracts at home, that a loaf may be sent to the War Office chemist at Woolwich, and his analysis shall be taken as conclusive evidence of the contents of the sample. It is best to advise this course whenever practicable; but where a M.O. is thrown on his own resources, should the means be at his disposal, he can proceed with the examination—physical, microscopical, and chemical—as taught at Netley, and detailed in Parkes' "Practical Hygiene." See p. 246.

Whenever any Government materials, or those supplied by contract, require chemical examination, they should be sent to the War Office chemist at Woolwich, but water for examination is directed to be sent to Netley.

The commission recently appointed on soldiers' food recommend that "M.Os. and all young regimental officers should undergo a course of instruction as to the quality of supplies, so that they may be able to decide whether the quality of the rations which they are called upon to inspect is equal to the standard quality authorised for troops."

**Ordinary Field Ration.**—Soldiers' rations while under canvas, and at most foreign stations, are increased to, meat 1 lb., and when fresh meat cannot be obtained,  $\frac{3}{4}$  lb. preserved meat will be issued.

**Grocery Rations** are not public issues either at home or abroad; but under special circumstances, during autumn manœuvres, for instance, a grocery ration as follows will be issued on repayment of  $1\frac{1}{2}d.$ :  $\frac{1}{4}$  lb. bread,  $\frac{1}{8}$  oz. tea, 2 ozs. sugar,  $\frac{1}{8}$  oz. coffee,  $\frac{1}{2}$  oz. salt,  $\frac{1}{36}$  oz. pepper. This grocery ration, added to the ordinary field ration, is called a "full ration," and the basis on which a magazine war ration is established.

**War Service Ration.**—During active operations in the field, as well as the grocery ration, as a free issue, the meat, fresh, salt, or preserved, will be increased to 1 lb., and fresh meat, if plentiful, may be increased to  $1\frac{1}{4}$  lbs.; it was so increased in Egypt; also vegetables, either fresh  $\frac{1}{2}$  lb., or compressed 1 oz., and lime juice  $\frac{1}{2}$  oz., with  $\frac{1}{4}$  oz. sugar on the days fresh vegetables are not procurable, may be issued. In Egypt, in 1882, when the men were showing a tendency to scurvy, I found that through carelessness or neglect on the part of the cooks to prepare vegetables, or owing to want of supervision, system, or some such cause, that the fresh vegetables issued were not cooked and served up to the men. It is not always because the commissariat make an issue and the men make "no complaints," that they get the article provided for their use, unless it happens to be a spirit ration.

**Spirit Ration.**—A spirit ration is not usually given to soldiers; but if the S.M.O. certifies that it is necessary for men on “flying columns,” an issue of  $\frac{1}{2}$  gill of rum can be made, to be charged for at the rate of 1*d.* per ration; but on active service, at the discretion of the G.O.C., on the recommendation of the S.M.O., it may be given as a free issue; or its equivalent, one pint of porter.

With respect to the issue of a spirit ration to troops, from all the evidence before me, and from a knowledge of the supervision required for its issue, and with due regard to the customs, habits, and propensities of the British soldier, it does not seem advisable to supply a spirit ration to our troops campaigning, although there are men who retain their self control with regard to spirits, and can be so far trusted as to obviate the necessity for supervision, and consequently might be allowed the use of a flask; still what may prove comforting to an individual sportsman will not suit an army.

It has been said that there can be no necessity for a spirit ration at all, as Hindoos never use it. According to the same reasoning, there should be no necessity for the issue of a meat ration either.

Alcohol is not food, neither does it supply any natural want, but by operating after the manner of tobacco and opium when habitually indulged in it prevents a want being felt. The greatest “break down” I ever saw on the march occurred in opium eaters who were deprived of the drug.

Soldiers not campaigning may be placed under such conditions for short periods as to render it undesirable, at a time when they are suddenly exposed to undue hardships, that in addition their dietetic regime and acquired habits should undergo a sudden change amounting to a deprivation. To abruptly cut off the supply on such occasions where there is not sufficient time allowed to effect a change, no matter how much it may be desired, is not a practical measure. Should a M.O., with due regard to the physical conditions to which the men are exposed, and not unmindful of the sentimental and moral aspect of the case, recommend the issue of a spirit ration ( $\frac{1}{2}$  a gill of rum) to each soldier, he should in nowise be held responsible for any excesses occurring through any irregularity or want of supervision of the issue.

It may be seen that all M.Os. who condemn the use of alcohol by troops on service do so, not altogether on physiological or medical grounds, but also on account of its ill effects on the morale of the troops and military discipline. *See pp. 282, 284.*

**Tobacco.**—Tobacco, whenever supplied to troops on service, will invariably be issued on repayment. *Soap* when issued from store is similarly dealt with in finance.

**Iron Rations.**—When troops upon service are detached from their transport, and necessarily carry their own supplies, the



ordinary iron ration for two days will be 2 lbs. preserved meat and 2 lbs. biscuit, to be supplemented or varied in such manner as circumstances admit. This is now called an *emergency ration*. See p. 258.

The following, taken from the Soldier's Pocket Book, are some rations which have been issued to our troops on service:—

“The rations issued in Abyssinia, when transport had become most difficult, were for Europeans, 1 lb. of biscuit or flour, 2 ozs. of vegetables,  $1\frac{1}{2}$  ozs. of sugar,  $\frac{1}{2}$  oz. of tea, and 1 dram of rum. For Indian soldiers, they were 1 lb. of flour, 2 ozs. of ghee, if purchased locally;  $\frac{1}{2}$  oz. of salt, and 2 ozs. of vegetables once a week.

“The rations issued during the Red River expedition were, 1 lb. of salt pork, or  $1\frac{1}{2}$  lbs. of fresh meat, 1 lb. of biscuit, or  $1\frac{1}{2}$  lbs. of fresh bread,  $\frac{1}{2}$  pint of white beans, or  $\frac{1}{4}$  lb. of preserved potatoes, 1 oz. of tea, 2 ozs. of sugar,  $\frac{1}{2}$  oz. of salt when fresh meat was issued, and  $\frac{1}{36}$  oz. of pepper. Upon this ration the men did the hardest work I have ever known troops called upon to perform, and no force in the field could have been healthier.

“The rations issued during the Ashantee war to white troops was, bread,  $1\frac{1}{2}$  lbs. fresh, or  $1\frac{1}{4}$  lbs. biscuit, or 1 lb. of flour; meat,  $1\frac{1}{2}$  lbs. fresh or salt, or 1 lb. preserved; vegetables, 2 ozs., rice or peas, or 4 ozs. of preserved potatoes, or 1 lb. of fresh; tea,  $\frac{3}{4}$  oz.; sugar, 3 ozs.; salt,  $\frac{1}{2}$  oz.; pepper,  $\frac{1}{36}$  oz. On days when long marches were made, or when an engagement was anticipated, 4 ozs. of sausage.

“The native levies, not being Fantees, received  $1\frac{1}{4}$  lbs. of rice, or 1 lb. of biscuit;  $\frac{1}{2}$  lb. of salt meat, or 6 ozs. of preserved potatoes. The native carriers received  $1\frac{1}{4}$  lbs. of rice. The native allies (Fantees) received 1 pint of rice and  $\frac{1}{4}$  lb. of salt meat. This ration for white troops was the largest ever given; the exhausting nature of the climate rendered it necessary to give the men as much as they could possibly eat and digest.”

The war ration supplied to the troops in Egypt in 1882 was defective in composition and insufficient. For the first few days after landing this was particularly so; much of the sickness which occurred might have been avoided had a more liberal scale of rations been adopted throughout. It should be a principle in dietetics to have an abundance of food ingested on first taking the field; the body should be replete with free albumen, as a supply store or magazine, available to meet subsequent demands on the system. During the Nile expedition a far more liberal scale was adopted, and bacon was issued. General Lord Wolseley says a soldier on service should get  $1\frac{1}{2}$  lbs. of meat. See p. 226.

The following was the ration issued to the Suakin expeditionary force, 1885:—

Bread,  $1\frac{1}{4}$  lbs., or biscuit, 1 lb.; meat, fresh,  $1\frac{1}{4}$  lbs., or meat, preserved, 1 lb.; tea,  $\frac{1}{2}$  oz.; coffee,  $\frac{1}{3}$  oz.; sugar,  $2\frac{1}{4}$  ozs.; salt,  $\frac{1}{2}$  oz.; pepper,  $\frac{1}{36}$  oz.; potatoes or vegetables, fresh, 12 ozs., or

vegetables compressed, 1 oz.; jam and marmalade, occasional; erbswurst, 2 ozs., occasional; lime-juice  $\frac{1}{2}$  oz., sugar  $\frac{1}{4}$  oz., rum  $\frac{1}{16}$ , when ordered.

A limited number of tins of preserved meat, gravy, vegetables, and pickles (mixed). It was requested that a record be kept of the suitability of these for field service.

The lime-juice issued was so palatable as not to require an officer to superintend its consumption. It is difficult to preserve lime-juice; the best way is to add 2 ozs. of alcohol to the quart in its undiluted state. When supplied in glass bottles, on service, they should be protected, otherwise they are too fragile; stone jars might be used, but they are very heavy. The acid would act on metals, if such were used for its conveyance.

During the summer of 1885, when S.M.O. of the British troops at Suakin, on my recommendation they received, in addition to the above, 2 ozs. of cheese daily, and pickles in the same proportion as supplied to troops on board ship; for some time in addition fresh-tinned tomatoes, which were left by the New South Wales contingent, were issued. With the exception of onions, these were the only vegetables approaching to fresh vegetables we had; no fruit; and on this ration not a man developed a scorbutic taint. But not so with the East Indian contingent, with whom we were serving; they suffered a good deal, as did also the Egyptian troops at Suakin during the previous year. I attribute this good result to a generous diet, chiefly of fresh meat, with cheese, which supplied any deficiency, and to the pickles and lime-juice in particular; moreover, this ration was commenced early as a preventative measure. Onions, after potatoes, are the best vegetables to issue to troops in war; no war ration is complete without them. See pp. 232, 261.

**Equivalents.**—The foregoing are a few of the regulations on this subject to be adopted as far as possible as a guide, but according to the climate and circumstances connected with an expedition a special scale may be fixed, and where it may be necessary or expedient to depart from this scale, the following scale equivalents will be followed:—

Biscuit	-	-	-	$\frac{3}{4}$ lb.	} Each to be estimated equal to 1 lb. bread.
Flour	-	-	-	$\frac{3}{4}$ lb.	
Rice	-	-	-	$\frac{3}{4}$ lb.	
Salt meat	-	-	-	1 lb.	} 1 lb. fresh meat abroad, or $\frac{3}{4}$ lb. fresh meat at home.
Preserved meat	-	-	-	$\frac{3}{4}$ lb.	
Porter	-	-	-	1 pint	$\frac{1}{2}$ gill spirits.
Preserved potatoes, uncooked				2 ozs.	} $\frac{1}{2}$ lb. ordinary fresh vegetables.
Compressed vegetables	-			1 oz.	
Rice or peas	-	-		2 ozs.	
Onions or leeks	-	-	-	$\frac{1}{4}$ lb.	

Split peas	-	-	-	$\frac{1}{8}$ pt.	Each to be estimated equal to $\frac{3}{4}$ lb. flour.
Calavances	-	-	-	$\frac{3}{4}$ "	
Dholl	-	-	-	$\frac{3}{4}$ "	
Oatmeal	-	-	-	$\frac{1}{4}$ "	

**Coffee.**—Coffee is such an important item in the victualling of troops, that it calls for a brief notice here. It enters into the dietary of the armies of all civilised nations, except perhaps the Russians, who seem to prefer tea. Judged by the rationing of their troops, the Russians must be a very abstemious people.

Parkes says—"Coffee is a most important article of diet for soldiers, as not only is it invigorating, without producing subsequent collapse, but the hot infusion is almost equally serviceable against both cold and heat; in the one case, the warmth of the infusion—in the other, the action on the skin, being useful, while in both cases the nervous stimulation is very desirable. Dr. Hooker tells us that in the Antarctic expedition the men all preferred coffee to spirits, and this was the case in the Schleswig-Holstein war of 1849.

"The experience of Algeria and India (where coffee is coming more and more into use) proves its utility in hot climates.

"It has been asserted to be protective against malaria. The evidence is not strong, but still is sufficient to authorise its use in malarious districts.

"*Making of Coffee.*—Roasted and ground coffee must be served out to troops, as the delicate operation of roasting can never be performed by soldiers. Exposed to the air, the roasted and ground coffee loses its aroma in from two to four months; but if packed in tins it will keep it for several months. The tins should not be too large, so that no more than necessary may be exposed to the air. It has been said that the tin is acted upon, but this does not appear to be the case for some time. The amount should be about six-tenths of an ounce for each person per meal.

"The coffee must be boiled, or the aroma is in part dissipated: but if made with water of 180° or 200°, the coffee only gives up 19 to 25 per cent., whereas it ought to yield 30 to 35 per cent. In order to get the full benefit of the coffee, therefore, after the infusion has been poured off, the grounds should be well boiled in some more water, and the hot decoction poured over fresh coffee, so that it may take up aroma; the coffee thus partially exhausted can be used on the next occasion for boiling."

Some of the best coffee in the world is brought into England and some of the worst is made there. Coffee in barracks is made in a soup can.

Pavy says—"The extent to which coffee is roasted influences materially the amount of matter susceptible of extraction. When roasted to a reddish-brown colour, and subjected to boiling water, he found 25 per cent. was extracted, against 19 per cent. when the roasting was carried to a chestnut-brown colour."

I found on service in Egypt in 1882 that many men complained that coffee taken in the early morning gave them diarrhœa. On mentioning this to a senior officer, he said he noticed the same thing occurred in the Crimea. This coffee was good. Perhaps any hot drink taken on an empty stomach in the cold raw mornings would cause a relaxation of the bowels.

It is right to see that the soldier does get coffee, and not the so-called French coffee, or what is sold as a mixture of chicory and coffee, which may contain more of the former than of the latter. Although such mixtures are nominally made up to suit the public taste, in reality they are concocted in the interests of the dealer.

**Examination of Coffee.**—"A preliminary examination may be made by shaking up some of the mixture in cold water in a test tube, when the coffee will be seen to float for some time, while the chicory rapidly absorbing the water sinks, and its more soluble constituents give a deep colour to the liquid. This affords perhaps as complete a separation as is possible by any mechanical means, and is thus a quantitative as well as a qualitative test.

"But the microscopical examination, for which very moderate magnifying powers suffice, is absolutely conclusive, the characteristic structures of coffee being unlike those of any adulterant, and those of chicory and roots in general equally unlike those of coffee.

"The greater part of the coffee bean is composed of small angular cells, containing in the raw state oil globules along with other matters. In roasting their outlines become less clearly defined, and the oil globules broken up and diffused, while the shrivelled contents form angular dark masses at one side of each cell. Even more characteristic are the fragments of the thin membrane contained in the cleft of the bean, which show under the microscope long oblique fusiform cells lying side by side. Starch granules are absent.

"In chicory there are large oval cells, not angular or polygonal, and with small groups only of granular contents; but the most characteristic structure is the laticiferous vessels, with their scalariform or ladder-like transverse markings. Carrot, mangel-wurzel, etc., are not very dissimilar, presenting the same features peculiar to roots; while acorns, burnt corn, etc., exhibit their respective forms of the starch granule. Except in the avowed form of date and malt coffees, however, chicory is the sole or almost the sole adulterant now met with."—*Willoughby*, "Principles of Hygiene."

It is sound in principle to oblige the soldier to participate in the expenses of his living; to give him a full ration, at all times free, is too much in the direction of spoon-feeding, and rather foreign to the instincts of the English people. Our present system, judiciously applied, ought to make men more self-reliant and thrifty. Although not advocating the issue of a larger free



ration to the soldier, his food should have more uniformity of supervision than at present; he requires greater protection by his immediate superiors from those who desire to get his money, by directing its expenditure into another channel; by letting the soldier have his money's worth in food, you tend to improve the man, to raise the status of the service, and benefit the country at large. As we stand at present, the effect of pay-day is to act as an inducement to crime and disease.

During peace, a stock of health should be laid in to meet the demands on the system caused by the strain of war; every sportsman knows that a horse which has been well cared for during the summer will be more likely to stand the strain of the hunting field during the ensuing winter than if he were worked during all seasons. Why not apply this principle to the training of the soldier for war? Only a certain amount of work can be got out of man or beast.

Although war, or the winning of battles, is the primary object of military training, still the physical and mental improvement and advantages of foreign service to young men who are to be passed into the reserves should not be neglected by the State, so that those men may become more earnest workers and more valued citizens, whose services will be sought for by the employers of labour.

**Rations in India.**—In India the ration of the British troops is 1 lb. of bread, 1 lb. of beef or mutton, 1 lb. of potatoes or other equivalent vegetables, 4 ozs. of rice,  $\frac{2}{3}$  oz. of salt,  $\frac{5}{7}$  oz. of tea,  $1\frac{3}{4}$  ozs. of coffee, and  $2\frac{1}{2}$  ozs. of sugar.

This is not a free ration. The stoppage to the soldier on account of this ration is six rupees five annas four pies per month, but the cost to the Government is 9 rs. 5 an.  $5\frac{1}{2}$  p. It has been estimated to improve the meat by feeding would cause on this item alone an increased annual loss of £362,674, or £9 6s. per man, an expense too great to be incurred by the Government.

**Preserved Food.**—The preservation of food is best secured by a knowledge of the conditions under which decomposition proceeds; they are access of air, presence of moisture, and a certain temperature. The exclusion of air from meat in bulk is effected by coating with substances such as glue, gelatine, paraffin, fat, etc. Fat has been employed after this manner: joints are plunged into fat at a temperature of 200° Fahr. to remove superficial moisture, they are then packed in dry casks, which are filled up by melted fat. Powdering the surface with charcoal is a good plan to preserve meat for a short period. The principles involved in the preservation of food are the exclusion and destruction of the necessary agents of decomposition. This is effected in the tinning of meat by the exclusion of air by exhaustion, by depriving air of its oxygen, and by the addition of antiseptic substances, etc. Freezing, as a means of preservation, is a process of suspending decomposition; and the same

may be said in a measure of the action of dry heat ; of the effects of this latter condition, some notable examples have been met with on the deserts of the Soudan. Drying with compression is the process usually employed in the preservation of vegetables. When reduced to one-seventh of their bulk by these means, one cubic yard may be made to contain rations for 16,000 men, at least so it is said ; after the process but little of the flavour or colour of the vegetables are retained. The value of compressed vegetables as food is very much over-rated ; when otherwise preserved more of their nutritive qualities—albumen and salts—are retained. When fresh fruits and vegetables are not obtainable, jam might be substituted for them. Food homeopathically prepared is but ill suited to sustain the soldier on service ; something more is required by him than a meat lozenge to place on the back of his tongue.

**Tinned Meat.**—The tinned meat usually supplied to soldiers in the field is thus prepared :—Each tin is packed with raw meat, and the top, which contains a very small opening in it, is soldered down ; a heat of  $212^{\circ}$  Fahr. is applied until the meat is three-quarters cooked ; then, while the steam is escaping by the opening in the top of the tin, it is hermetically closed with solder ; the heat is then raised to  $230^{\circ}$  Fahr. The tins are subsequently kept in a room at a temperature favourable to decomposition ; when thus tested, if no bulging of the tins occur, they are considered fit for issue. Some tinned meat supplied to the troops in Egypt in 1882 was of doubtful quality. Packages of preserved food should not exceed 60 lbs. in weight, so as to be easily carried by one man.

*Pemmican* is a mixture of beef and fat dried together ; it is valuable food. Sugar, raisins, and currants are sometimes added, and give variety. This sort is specially useful where there is deficiency of vegetables in the ration.

*Erbswurst*, prepared by Kopf, is issued to troops on service ; it is composed of pea-flour, made into a paste, with meat, fat, pepper and salt added ; each tin contains 2 ozs., and holds a ration of soup for a man ; it is of doubtful value as food, but adds variety to the ration. It should be regarded more as supplementary to than as a substitute for meat.

Food if over-compressed and deprived of the water natural to its composition, is physically changed, and loses by such concentration much of its nutritive qualities. It is the result of experiments with all foods prepared on the best-known chemical and physiological principles, that they are practically unsuited to provide for certain conditions required in the phenomena of life ; if a man is kept on them alone for any length of time he falls off in flesh and strength. In concentrated and chemically prepared foods, sufficient importance does not seem to be attached to those portions which pass off as excretions, while such as are undigested and indigestible are generally looked upon as a direct

loss, yet all these fulfil very important purposes. Something more is required than complete digestibility and power of absorption in order to gain a full physical effect and retain health in a normal condition.

In the victualling of our troops there is a tendency to place too much dependence on preserved meats and vegetables; like salt meat, they should be regarded more as varieties of food, and used sparingly as substitutes for fresh provisions.

Dried and compressed vegetables ought to be soaked in water from four to five hours before being cooked; this is a drawback to their use when troops are moving on service. The regulations say that the men's dinners should be ready within one hour after their arrival at the camp ground. When fresh meat is available, it should be killed as soon as the troops arrive in camp, and issued to corps for use on the following day. A tin-opener might with advantage be attached to the clasp knife which forms part of a soldier's field kit.

Among the various changes in life to which soldiers are subjected, the change from the fresh food to which they are accustomed in quarters to a preserved and highly-concentrated dietary in camp, must be reckoned as one cause for the occurrence of derangements of the digestive organs and camp diarrhoea; but apart from the physical and chemical characters of the food itself, tinned provisions of all kinds may contain copper and tin or lead from the vessels in which they are boiled, or from the soldering of the cans; further, lead from the solder frequently contains such impurities as arsenic and antimony. The acids in fruits, in vegetables, and other acids in provisions, have a corrosive effect, increased by galvanic action between the metals in which the food is preserved; this action is most likely to be set up or intensified when tins are exposed to the direct rays of the sun in tropical countries. Tinned provisions are so extensively used by our troops on service that they are reckoned upon as a matter of strategical importance in calculating the chances of success of a campaign. M.Os. will do well to bear these things in mind when searching for the causes of those irritations of the digestive organs which are of such a common occurrence in camp. Care must always be taken that food does not become directly or indirectly a source of disease.

With a diet wholly composed of tinned meats and preserved vegetables, issues of vinegar, olive oil, pickles, onions, and jam are indicated; vinegar and other acids exercise so powerful a retarding influence on salivary digestion as to contra indicate their use with a diet chiefly composed of bread or other starchy foods. Whether nitrogenised or non-nitrogenised substances constitute the bulk of a diet without variety, an effort should be made to procure condiments to assist in adding variety, and in order that they may excite secretion and facilitate digestion.

**Fluid Meat Extracts** are more suited for use as diet extras or "medical comforts" than they are as food for an army.

**Food Supplies to an Army in the Field.**—The following are some of the most recent regulations on the subject:—

"The food supplies taken with a battalion of infantry into the field are as follows:—

*On the Man.*—Some food (biscuit or bread in haversack and meat in mess-tin) to last during the march, or battle, until the supply wagons come up—probably late in the day—and an 'emergency' ration (hitherto called the *iron* ration), which is only to be used under orders from the general or other officer commanding the force on the spot (except in case of dire necessity), and then the fact must be at once reported to the brigadier or general commanding the division. See p. 250.

*In the Company and Head-quarters Wagons.*—One day's reserve ration of biscuit, meat, and groceries, in cases; and a pannier with one day's groceries, broken up, the latter for distribution on arrival in camp.

*In the Supply Wagons.*—One complete day's rations (fresh or preserved, according to circumstances) for regimental issue on reaching the camping ground.

*Wood* is supposed to be cut locally, but 1 lb. per man is carried in the supply or tent wagons for *kindling* purposes.

*Water* is supposed to be obtained locally, but every man should carry water or tea in his water-bottle on the march.

**Summary of Food**, for which the C.O. of a regiment is responsible on marching off in the morning:—

	No. of Days Provided for.	
	Rations.	Forage.
Carried by the men—an emergency ration for one day; also a portion of the rations issued and cooked the afternoon before, to last till the next regimental issue* - - -	1½	—
Carried by each horse - - -	—	½ for use on the march.
Reserve rations in head-quarters and company wagons - - -	1 + 1 day's groceries in panniers.	—
Reserve rations for draught horses, carried in their wagons - - -	—	1 for draught horses, 20 lbs. of patent forage.
Rations and forage for issue on arrival in camp in supply wagons - - -	1	1 12 lbs. of oats.
Total - - -	3½ + 1 day's groceries	1½ for riding horses. 2 for draught horses.

\* On first leaving barracks or board ship, a special issue must be made to provide for this.



*The system of supply of rations in the field must vary, more or less, according to circumstances. It would usually, however, be as follows:—*

The men would start with some broken rations in haversack and mess-tin, and with "emergency" rations as may be ordered.

The regimental transport would start with the amounts described in regulations.

As soon as the regimental transport arrives, the distribution of the supplies would take place. The amount of meat and biscuit or bread to be handed over to the cooks at once must be settled regimentally. It will often be convenient to hand over a portion only for the men's dinners, and to cook the remainder afterwards, and issue it to the men cold for the following day's march. At all events, the groceries and a portion of the biscuit or bread would usually be issued after the dinners had been arranged for. Grocery panniers (to be carried in the company wagons) are provided to facilitate the distribution of groceries by the Q.M. to companies, and by companies to the men.

Unless there is extra transport available, it will be always found difficult to carry either fresh bread or fresh meat on the regulation supply wagon. Meat, as a rule, should be slaughtered only when required for issue.

When the regimental supply wagons have been emptied, they would be driven to the supply dépôt, and filled up again for the next day's march.

The next morning fires would be re-lit, and tea or coffee (issued from company grocery panniers) prepared, if possible, before the march.

"If you wish to reap great results from an impending action, every exertion should be made beforehand to collect supplies for several days at some point within one day's march in rear of the army. Two days' rations should always be issued the day before a battle. These arrangements will set free a large amount of transport for the removal of the wounded immediately the action is over."—*Wolseley*.

**Requisitions as a Means of Supply.**—The rapidity of movement in modern warfare will reduce the value of magazine rations as a means of supply, so the system of requisitioning when in occupation of an enemy's country will become the rule. However, among a barbarous people an army could not subsist were it to advance without its rolling magazine and supply transport.

Hitherto, on account of the extent of our contract system, officers of the supply department have had but little professional training, the provisioning of the army being almost exclusively under control of civil and regimental administration.

According to Clausewitz, "the most densely populated place can furnish food and quarters for a day for as many troops as there are inhabitants, and for a less number of troops for several

days. . . . In quarters which have never been occupied there is no difficulty in subsisting troops three or four times the number of inhabitants even for several days. . . . In a moderately populated country, that is, a country of 2,000 to 3,000 souls per square mile, an army of 15,000 combatants may be subsisted by the inhabitants and community for one or two days within such a narrow space as will not interfere with its concentration for battle, that is, therefore, that such an army can be subsisted on a continuous march without magazines or other preparation."

Colonel Hazenkampf, in his work, "The supply of an Army in time of War," says:—

"From the experience of former wars we have come to the following general conclusions—

"(1st.) If the population of a given point or locality be equal to the number of troops, it can supply them for a period of four, but not more than six, days.

"(2nd.) If the number of troops be half the number of the population, they can be maintained at the expense of the latter for one or two weeks.

"(3rd.) Lastly, the number of troops being a quarter of the number of inhabitants, they can be supplied for a space of three to four weeks.

"An army corps of 60,000 men can be easily supplied from the means of a country which has 150 inhabitants to the square mile, but only while on the march. It must not halt at one place in a concentrated position."

The following rule is given for demanding supplies on requisition; one ration daily for every three inhabitants of a well-cultivated district, and one for every six inhabitants in mountainous and poorly cultivated countries.

In cases where an army operates in countries either uncultivated or devastated, mountainous, poor, or thinly inhabited, or has to fight for several days consecutively on the same ground, or to meet the resistance or cunning of the inhabitants, it is plainly impossible for it to subsist on the resources of the country. These cases are of frequent occurrence in our expeditions.

The Germans, who made such a large use of requisitions during the Franco-German war of 1870-71, do not appear to have had any fixed rule upon which to base these demands; but "The aim of the German officers was evidently to exhaust all the occupied towns, and to make it absolutely impossible for them to assist finally in contributing towards the expenses of the war."—*Furse*.

As well as during the Franco-German war, the system of requisitions was practised during the Peninsula wars, the Russo-Turkish war of 1878, and the Afghan campaign during the two years previous to 1880.

We see density of population beyond a certain limit means being deprived of health, but to the invader of a country, from a supply and transport point of view, it means easy subsistence and probably good living. Yet such good living may also mean excessive overcrowding, which will soon prove to be bad living.

Young men require more nitrogen in their food than the matured adult. It is surprising how quickly young soldiers on service develop a disposition favourable to the attack of infectious diseases, notably enteric fever.

When sufficient nitrogen is not taken as food, and the store of soluble albumen in the tissues is exhausted, the system at large is called upon to supply what is required for carrying on those functions necessary for its existence; in addition, there will be calls on it for oxidisable substances, such as fat, to supply the demands made by enforced labour during a campaign; consequent on this latter condition, an undue amount of non-nitrogenised substances must be liberated, which will further require to be oxidised and removed under the influence of nitrogen, and here is a second demand for nitrogen consequent on the original deprivation and the demands of labour. The nitrogen in the framework of the body is not available or capable of supplying this want, so a quantity of effete substances are retained within the body, and woe betide the army in the condition in which there remains an excess of these liberated substances, specially adapted for combination under the influence of nitrogen. When the nitrogen, instead of being supplied in the form of food, is taken in as diseased particles or particles of disease, which convert it to their own use, the human body under such conditions becomes the feeding ground of infectious disease. Nitrogen is the basis of all living organisms. We see Parkes, in order to meet the excessive demands on the system during active service, recommended the proportion of nitrogen to carbon contained in the soldier's ration to be increased from 1 to 15 to 1 to 13. In some of our campaigns, in Afghanistan, for instance, the relative proportion of nitrogen exceeded this. It is well known that armies after the end of a campaign get sick at a time when good food, water, and shelter are abundantly provided; such sickness is supposed to be due to reaction and inaction after undue excitement and physical labour. No doubt some of it may be thus accounted for; but after an army is reduced to such a condition as here sketched, through privations, hardships, excessive labour, over-crowding, want of sanitary precautions, and other untoward conditions incidental to campaigning, although still regarded as healthy—judged by the number reporting sick, the number of men in hospital, and the nature and type of their diseases—they should not be kept within confined walls in a barrack or a town one day longer than is absolutely necessary. Open air with its oxygen in an active state is required to assist, by its invigorating properties and chemical action, the removal of

effete matter from the system, also to starve out or render abortive particles of disease if present, as well as to be available for utilisation under the influence of nitrogen as the power of assimilation is restored. While the system is regaining its normal condition, inaction and stagnation, those fostering agents of disease, should be avoided. Men in this condition should be camped out and moved about in the open air, and the sick should be treated as much as possible in the open air. The proportion of nitrogen in their rations should be on a liberal scale, as it will be required to repair or replace what is lost.

This condition of the body, which in so marked a manner predisposes to and develops disease, is best removed by camping men in a mountainous district, so that the mountain breezes may circulate among them. On account of the rarefaction of the air at high altitudes, the quantity of oxygen in it is diminished, but the quality is good, and the deficiency is compensated for by the acceleration of the respiratory and circulatory process; there is also in these regions an increased evaporation from the skin and lungs. Such a change is better suited to men in this condition than a sea voyage, as they are rather crowded on board ship, unable to take any exercise, and inhale an atmosphere humid and condensed by pressure.



## CHAPTER IX.

## MEDICAL OFFICERS DOING DUTY WITH TROOPS IN BARRACKS.

A M.O. attached to a regiment is subject to the orders of the O.C., but as regards medical and sanitary matters he will be guided by such instructions as he may receive from his departmental superiors. His duties are to perform all the military medical duties of the corps; he attends parade when the corps is inspected by a general officer, when artillery are at gun practice, and also with infantry at musketry practice when necessary.

He will make weekly health and sanitary inspections; the inspection of the regimental cells daily, and of the corps or any men belonging to it when required; he will also inspect men moving from one station to another, going abroad, or on active service, and all men, women, and children prior to their embarkation on board ship.

When no M.O. is specially appointed to attend on officers, their families, and soldiers' families at a station, he attends those of the regiment to which he is attached, also such servants of officers as are entitled to attendance. A nominal list of persons entitled to medical attendance, with their addresses, is furnished to the S.M.O. at the station on the first of each month on A.F. A 23. All prescriptions are directed to be made up at the hospital.

In addition to his regimental duties, the M.O. will be available for duty in the station hospital or for any professional or departmental duty for which he may be detailed by the P.M.O., and will carry out all instructions received from him.

A junior officer is generally attached to a regiment, while the seniors attend to the sick; yet it is not desirable that a very junior officer be appointed to barrack duties. Some knowledge of the customs of the service is required in carrying out satisfactorily these important duties; however, a C.O. under our present system can always obtain advice from the S.M.O. at the station.

The weekly sanitary and health inspection of troops in quarters is a very important matter, to which sufficient attention is not paid throughout the service. This is a purely executive military duty, which should never be performed in a perfunctory manner. A M.O. is the only officer outside a regiment authorised to make inspections, such as are in intimate connection with the mode of conducting the interior administration of its affairs; consequently now that M.Os. form no part of a regiment, the

position is rather strained ; every one acquainted with regimental life must know that the disposition, acquired through the customs of the service, is to regard this more or less as outside interference ; conversely, this is a reason why M.Os. do not as a rule visit barracks more frequently than is absolutely necessary. However, it is no valid reason why a duty devolving on a M.O. should not be thoroughly and earnestly performed. If due importance is not attached to a sanitary duty by the Medical Staff, neither C.Os. nor soldiers will be impressed with the necessity for a careful observance of sanitary rules. The statement that it is during peace we must prepare for war, involves a principle as applicable to sanitary considerations as it is to other matters. The lessons learnt and habits acquired in barracks, whatever they may happen to be, men will carry with them on service in the field, and finally into civil life. When the soldier is imbued with a desire for cleanliness, and understands the necessity for fresh air and pure water, more is done to ensure the health of an army than all the field force orders ever issued on these subjects. When the will is strongly exercised by the necessity, the intellect suggests the means whereby to accomplish the object aimed at.

The interior economy in corps, which means regimental administration in all its branches, should operate solely within the lines of our military organization, and in conformity with the rules which govern the general administration of the army.

Every M.O. accustomed to visit barracks must be struck by the difference that exists in the tone, manner, or disposition of the men in various regiments, and the system or non-observance of system in carrying out its interior economy. Whenever it is found that the sanitary condition of barracks, and the personal hygiene of the men are neglected, you may rely upon it that such a regiment is not in a good serviceable condition ; and whatever hobbies the colonel may have relative to the dignity of command, the pomp of parade, or conduct of correspondence, etc., the preservation of health, and all the comfort, contentment, and happiness attendant on it, is not one of them. On service, if not relegated to the base, such a regiment will crumble to pieces and evacuate itself. Only healthy troops are required in the fighting line.

**An Inspection-room** is provided in barracks when considered necessary, where the M.O. sees the sick of the corps every morning, and any prisoners sent for inspection.

Recruits are inspected at the hospital ; men requiring vaccination should also be sent there. The recruits' register and vaccination register are medical records, kept at the station hospital.

The inspection-room is a regimental institution in connection with the medical services ; the station hospital is a garrison in-

stitution. The inspection-room and its furniture are in charge of the O.C. of the corps occupying the barracks whose men are inspected there.

**Orderly.**—The O.C. provides a permanent regimental orderly as an attendant and messenger under the orders of the M.O. for all medical duties, to look after the furniture, equipment, and to keep the room clean and regular.

The M.R. state that this orderly should be either a N.C.O. or a private in possession of a second-class school certificate.

The inspection-room itself with its fixings, such as a lock-up place for medicines and instruments, and the barrack furniture, are in charge and accounted for by the regiment or corps.

### List of Barrack Equipment for Inspection-room.

- |   |   |
|---|---|
| 1 — Beds, hair barrack, filled.                         | 1 — Lamp, oil, complete.  |
| 1 — Bedsteads, iron, barrack.                           | 1 — Mop with handle, complete.  |
| 1 — Blankets, grey, G.S.                                | 1 — Pail, wood, water.  |
| 1 — Boards, inventory.                                  | 1 — Pokers, officer's.  |
| 1 — Bolsters, hair barrack, filled.                     | 1 — Shovels, fire, officer's.   |
| 1 — Boxes, cast iron, coal.                             | 1 — Stands, washstands, japanned, H.P. complete.                              |
| 3 — Brushes : scrubbing 2, sweeping 1.                  | 1 — Tables, officers', soldiers' tables and forms, 6ft. or 4ft., as required. |
| 1 or 2 — Candlesticks, when gas or oil is not supplied. | 1 — Tongs, officer's.   |
| 1 — Cases, slip, bed, hair barrack.                     | 4 — Towels, hand.   |
| 1 — " " bolster, hair.                                  | 1 — Trays or tubs for coal.   |
| 2 — Chairs, officer's or Windsor.                       | 1 — Bellows, where turf or coal is issued as fuel.                            |
| 1 — Cupboard.   |   |
| 1 — Fenders, officer's.                                 |   |

This equipment is shown on the inventory board in the room.

Windsor soap is allowed in the inspection-room, for the personal use of the M.O., at the rate of one cake a month.

**The Medical and Surgical Equipment** of the inspection-room is in charge of the M.O.; he is responsible for it. This equipment is directed to be kept in the room under lock and key. A return in manuscript is to be sent in half-yearly on 1st April and 1st of October of this equipment, which is as follows :—

- |                                 |                            |
|---------------------------------|----------------------------|
| One field medical companion.    | One set of common splints. |
| One stomach pump.               | One stethoscope.           |
| One pouch of tooth instruments. | One test dot card.         |

**Medicines.**—The M.O. in charge obtains by requisition on A.F. I 1209 any medicines the P.M.O. may consider necessary; in addition to what are in the **Field Companion**, all such articles as may be required to complete the Field Companion are also supplied from the station hospital in which the men of the regiment are treated,

**Transfer of Duty.**—Whenever transfer of the duties of charge of regiments or corps take place between officers, the M.O., handing over the medical and surgical equipment, is required to send in to the officer from whom this equipment is held a report signed by both officers stating that the transfer has

taken place. In this report it should be noted the condition of each article of public property; it should also be stated that the diary has been transferred. The entries in this diary will assist when drawing up the annual sanitary report.

It is not sufficient to state the condition of any article of equipment as incomplete or unserviceable, etc.; whenever such remarks are necessary, it should be stated in what respect the article is deficient or damaged. An order affecting transfers similar to this would apply to all public property, whether medical, surgical, barrack, or hospital equipment in charge of the department. Public records in possession of the officer to be relieved should also be shown on a return. It is the duty of an officer in charge of public property to hand it over on leaving the appointment which necessitated its use, and it is he who is responsible for making out the transfer returns connected with the transaction. *See* Remarks, sec. 6, A.A.

**Correspondence.**—Whatever stationery a M.O. in charge of a regiment should require, and the few army forms and books necessary are supplied to him by the P.M.O. of the district on application through the S.M.O. at the station.

The only correspondence a M.O. in charge of a regiment can have is in matters immediately concerning it. Much can be done without writing—by speaking to the O.C., the adjutant, or the quartermaster, who is the conservancy officer of the corps. The general conservancy of an encampment comes under the military police. While fresh in the memory, a note had better be taken of all such interviews.

The O.C. of a corps should only be addressed as such by the M.O. attached or in charge; if in addition he is C.O. of the troops at the station, on account of this position he should be addressed either through or by the S.M.O. on matters outside his regiment or corps, or such as are of a general nature concerning all the troops in garrison.

Any sanitary improvements considered necessary for the well-being of the regiment involving expenditure—such as new works, alterations, and repairs of a sanitary nature, and indeed all engineer services—ought to be submitted by the M.O. in charge for the approval of the S.M.O. before being passed on to the military authorities.

When directing attention to sanitary defects, there is no necessity for stating how the removal of a nuisance, involving an engineering problem, can be effected. In all cases care should be taken, where means of improvement are suggested, that such are in accordance with existing regulations and the orders by which interior economy is conducted in the corps. Each corps has its own permanent or standing orders; these orders differ much in regiments; each one has, as it were, its own way of doing things—this is a matter where more uniformity might be



expected in the service; however, a M.O. must carefully avoid any comparison between corps, as each C.O. thinks his own the best.

Sometimes in orders—and indeed, also, in regulations—the words certificate and report are used as if they meant the same thing, or a certificate is asked for where a report is all that is necessary. For instance, when an officer is ordered to visit barracks and satisfy himself as to a certain condition of things, if on the spot he has been told by a responsible N.C.O. concerning a matter which it is his duty to know, the officer in such a case should not be asked to certify, but to report, when he completes the duty. *See Certificate*, p. 50.

**The Company Sick Report** of every N.C.O. or soldier brought before a M.O. on account of sickness, made out according to the form prescribed in the Q.R., will invariably be sent with the man in duplicate. The reason the “prescribed form” is given in the regulations is to allow of its being made out correctly in manuscript whenever A.F. B 256, on which it is printed, is not at hand. If “particular care,” as stated in the regulations, is not taken in filling in this report, the hospital records cannot be correctly kept.

Frequently on service these instructions are neglected. An idea prevails to some considerable extent in the army that anything in the way of returns or information will do for the hospital; consequently, when it is required to trace a man and the disposal of his arms and accoutrements, perhaps all the help one can get is that he went sick on a certain day in camp or on the line of march. Special care should therefore be observed in recording every man's name and number, and the other information required in these reports.

**How Soldiers Report Sick.**—At reveille the troop or company orderly corporal should visit each room occupied by the men of his troop or company, and find out if any men are going sick; he will then make out the company sick report in duplicate, get it signed by the company orderly sergeant, and give it to the regimental orderly corporal. The regimental orderly sergeant parades the sick, and sends them to the hospital in charge of the regimental orderly corporal, who will march them there or to the inspection-room in barracks, as the case may be. When sick are discharged from hospital they are paraded by the wardmaster and handed over to the orderly corporal. The duty should be arranged so that the sick arrive at the hospital at the appointed hour for morning visit; at home stations, the hours of morning visit for M.Os. at hospital are before 10 o'clock, and in the evening between 5 and 8 o'clock.

The regimental orderly corporal, on returning from the hospital with the copies of the morning sick reports, acquaints the colour-sergeants of companies, also the sergeant-major and quartermaster-sergeant, with the names of the men admitted,

discharged, or retained for light duty. But all this is a matter of detail relating purely to the interior administration of a corps, and is differently arranged in regiments. The corporal marching the sick attends at the hospital in the afternoon to receive over any men discharged from hospital, or those who may have been detained there only for the day. These men he hands over to the orderly sergeants of companies. If men are admitted he should so inform the orderly sergeant.

On the back of the company sick report are shown the names of the men leaving hospital on the day following. From the record of admissions and discharges in this report the Q.M. of the regiment is enabled to regulate his ration return.

**Kits of Men Sent to Hospital.**—When any man is admitted into hospital, is sent to prison, or proceeds on furlough, the colour-sergeant of his company will take charge of his rifle and accoutrements. He will also take charge of the kits of men who are absent without leave, or in the case of any casualties occurring through desertion or death.

All articles of kit, clothing, and necessities, but not stable necessities, arms, or accoutrements, are to accompany a man to hospital. The kit varies in the different arms of the service. What men ought to have, "the establishment," according to the form of inventory used in barracks, A.F. B 253, and what they really have when they arrive at the hospital, is sometimes different; indeed, so frequently is this the case, that there is no use in sending this inventory with them. It is not required by regulation, probably on this account.

In India the kits of men reporting themselves sick are kept in their kit bags, taken charge of in the company, and not sent to the hospital.

**Kits of Men Discharged from Hospital.**—When men are discharged from hospital the ward-master will parade them, and will see their kits, money, medals, etc., are correctly delivered over to them. He will hand the men over, after they are inspected by the orderly M.O., to the N.C.O., whose duty it is to march them to barracks.

**Entries in Sick Report, how Made.**—In the sick report a M.O., if he disposes of the case himself, enters in the column of remarks in ink the words "light duty," "medicine duty," or "duty." This latter entry implies that the man has committed a crime in that he reported himself sick, well knowing at the time of so doing that he was not sick, and thus evaded his duty.

In the report which accompanies the men sent on to the hospital from the inspection-room, "the diseases and any remarks will be entered in pencil only." In all cases of a febrile nature it is a good plan to have the temperature taken at the inspection-room recorded in the report. In case of admission, this temperature can be noted on the margin of the diet

sheet. The M.O. who disposes of a case of illness should make his entry in ink on the sick report and initial it. There is no order that the sick report should be signed by a M.O.

Men requiring only trivial dressings or medicine will be dealt with at the inspection-room, and the words "medicine duty" written opposite each man's name in the sick report.

Soldiers reporting sick, who are temporarily unable to perform all their duties, may be recommended for "light duty" for the day. If they come sick again within 24 hours, they must be sent either to duty or the hospital. At some stations a room or ward is provided where men are detained, but their detention is never to exceed 24 hours.

More latitude should be given in the exercise of judgment in these cases, in the mounted branches especially. Men unable to ride for a few days on account of an abrasion, boil, or slight injury, could do all their stable duties, and get a little dressing without lying up in hospital.

**Inspection of Prisoners.**—"Any prisoner sent for inspection preparatory to trial by court-martial, or before commitment to prison under sentence of court-martial or summary award, will be inspected by the M.O., who will sign the required medical certificates, or send him to hospital for treatment should this be necessary."—*M.R.*

It always seemed unnecessary to send men charged with minor offences or simple acts of drunkenness who could only be fined to get a medical certificate of health. As the matter now stands, if the adjutant or C.O., before dealing with a charge such as might necessitate imprisonment, asks the man if he is ill, or if he wishes to see a M.O., this ought to be sufficient for the C.O. to thus satisfy himself that the man is able to undergo such punishment as he can award him. A man reporting himself sick immediately after the award of a punishment by his C.O. in ordinary cases cannot be proceeded against for "concealing his disease"; but in order to prevent a miscarriage of justice, in the case of a soldier stating he was not sick at the time his charge was about to be investigated, he might in this case have committed an offence in that he stated a wilful falsehood, which under such circumstances would be conduct to the prejudice of good order and military discipline, a charge under sec. 40, but the offence of "concealment of venereal disease" will now be dealt with under sec. 11, A.A. See sec. 18, p. 29.

Prisoners for trial are examined by a M.O. on the morning of each day the court sit. "C.Os. are responsible that no prisoner is brought before a court-martial if in the opinion of the M.O. he is unfit to undergo his trial." Courts-martial at home usually assemble between the hours of 10 a.m. and 4 p.m., or 11 a.m. and 5 p.m.

**Soldiers Reporting Sick without Cause.**—When a soldier reports himself sick unnecessarily the word "duty" will

only be marked opposite his name. It would be well in such cases for the M.O. to sign his name to this remark, as it amounts virtually to a criminal charge. I may caution junior M.Os. to exercise great care in ascertaining the facts of the case, by physical examination and otherwise, before making this entry, which the C.O. of the man is pretty certain to take notice of and act on. There is no such entry now as "no appreciable disease."

This relates to one of the most important duties of the military surgeon, especially during war, when the sick and wounded have to be evacuated, and those men capable of rendering further service returned to the ranks. Civil practitioners have not the same responsibility cast on them when dealing with their patients, when every statement is considered as made in good faith by those who seek advice.

A soldier is fully entitled to the benefit of a doubt should any doubt be entertained as to his condition. *See p. 31.*

The pressure of belts, ball-bags, and equipment generally, if long continued, give rise to muscular pains of a rheumatic character about the chest, shoulders, and abdomen; in the latter case, chiefly referred to the region of the stomach and liver, although there is no loss of appetite or tenderness on percussion or pressure, a more or less intense feeling of heaviness, uneasiness, or depression is complained of. The pains referred to as occurring about the chest and shoulders in some instances may arise from pressure on the nerves, or be due to periostitis of the ribs or clavicles; anyhow, they are sufficient to incapacitate a man from carrying his equipment marching. In some cases, of course, the pleura may be affected, but in the absence of any objective symptoms of disease or chest complications, such as are met with in civil practice, a medical officer should be careful, on negative evidence of this sort, not to submit a charge of feigning disease against a man who is for some time at defaulters' drill or on the line of march. Palpitation of a transient but recurring character, which is easily excited by military duty, is a frequent cause of temporary indisposition among soldiers. *See p. 31.*

Malingering, feigning disease, and kindred offences are not so prevalent of late years as was formerly the case in the army—a circumstance due to change of system and improvements in the terms under which the soldier serves.

It has been frequently said that M.Os. of regiments knew the malingersers, but, on the other hand, the malingersers knew their M.Os. and the regimental hospital staff, and they were no doubt sharp enough in many cases to turn such knowledge to account to suit their purpose.

Comparatively with other armies, feigned disease is unfrequent in our own. In armies raised by conscription feigning of disease and the retarding of recovery are extensively practised;



to such an extent was this carried at one time in the French army, that it was said to have been "brought to such perfection as to render it as difficult to detect a feigned disease as it was to cure a real one." See p. 443.

**Reports.**—A report must be made of all cases of sudden death, severe injury, unusual occurrence, or outbreak of disease in barracks to the O.C. and S.M.O. A report should also be made of the occurrence of any unusual amount of specific disease among the civil population. Whenever epidemics occur among the troops, reports will be sent periodically to the D.G. These reports are sometimes required daily.

**Sanitary Reports and Inspections.**—It is laid down by regulation that a M.O. will make a health and sanitary inspection of the troops, and will visit the barrack-rooms, guard-rooms, cells, canteens, and every portion of the barracks once a week. This inspection usually takes place on a Saturday. The M.O. is directed to note in his Sanitary Diary, Army Book 39, the result of each inspection. These diaries, or an abstract from them, will assist the S.M.O. at the station in compiling his quarterly sanitary report. It is desirable that the officer furnishing this report should himself inspect the troops during the quarter; if this were done, the report would be of greater value than it is at present, and the troops might benefit from being inspected by an officer of much experience.

**Married Quarters.**—The M.O. making these weekly inspections "is to be particular in observing the married quarters, and to report to the O.C. if they are not kept in a proper state of cleanliness." A good order observed in some regiments is that "at the weekly inspection by the M.O. the women will be present in their rooms cleanly dressed with their children, and will bring to the notice of the inspecting M.O. any appearance of disease."

**Quarterly Sanitary Report.**—The following questions have to be answered in the Quarterly Sanitary Report, A.F. C.344. They show the different subjects that should specially engage the attention of a M.O. making a sanitary inspection of troops:—

1. State of barracks, huts, or tents, and of guard-rooms and cells, particularly with reference to overcrowding, and the state of ventilation. Mean cubic space and superficial area per man, for the quarter, in barracks, huts, cells, and guard-rooms.

2. State of latrines, urinals, and ash-pits, and of ablution and bath-rooms, and wash-houses.

3. State of drainage and sewerage, and general sanitary condition of the vicinity of the barracks and station.

4. Means of cooking, and condition of barrack kitchens.

5. Rations of the troops, with special reference to their quality, and any change in quantity during the quarter.

6. Water supply—its source, quality, and sufficiency.

7. Quality of the liquors and other canteen supplies.

8. Clothing of the men ; whether it is suited to the climate of the station, the season of the year, and the state of the weather.

9. Duties of the troops. Do they appear to have exercised an unfavourable influence on health ? Average number of nights in bed.

10. Hospital accommodation. Special notice to be taken of the state of ventilation, and of any overcrowding of the beds, with explanation of the causes which render the latter necessary. Average cubic space and superficial area to each patient in wards for the quarter.

11. Character of the prevailing diseases, and if apparently influenced by any of the preceding conditions.

12. Special prevalence of any diseases among the civil population in the vicinity of the barracks, camp, or station.

13. Statement of any recommendations bearing on the health of the troops, which have been made to the officer commanding, —with the results.

**Annual Sanitary Report by Medical Officer doing Duty with Troops.**—M.Os. doing duty with troops and in charge of sanitary duties will severally prepare in a concise form the portions of the annual manuscript report which refer to their particular duties, and furnish the same to the medical officer in charge of the hospital, who will attach them to his annual report on prevailing diseases. A M.O. on being relieved will hand over the report on his special duties, completed to the date of his handing over his charge.

**Cubic Space in Barracks.**—The regulation allowance of cubic space for soldiers at home is 600 cubic feet per man in barracks, in huts 400. Abroad the cubic space varies. The amount is fixed for each command (*see* p. 205). The proportion of cubic to superficial space should be about the same as the proportion of nitrogen to carbon in a well-regulated diet, namely, as 1 to 15 ; but in hospital the superficial area ought to exceed this proportion.

*The normal size fixed for a soldier's room is—length, 77 ft. ; breadth, 21 ft. ; height, 10 ft. 6 in., to accommodate 28 men.* In cases where the estimated accommodation in barrack-rooms was exceeded, the occupants have been known to complain that they were deprived of their proper ration of air. C.Os. are responsible for overcrowding their men beyond the allowance regulation space to which they are entitled.

*The barrack-room unit consists of—1, the barrack-room ; 2, the sergeants' room ; 3, an ablution-room ; 4, a night urinal.* It is necessary that the M.O. in charge should inspect each of these to see that they are clean and properly looked after. The ablution-rooms attached to the men's rooms are to be provided with a bench for three basins and foot-basins, at the rate of 4 per cent.

Baths in barracks are provided for the men at the rate of 1 per cent., and latrine compartments at the rate of 5 per cent. on accommodation. The same percentage is allowed to N.C.Os. and men's married quarters; also women and children in like proportion.

**Guard House** for a battalion 850 rank and file, which is the *unit of barrack-room construction* is arranged as follows:—The guard-room and prisoners' room are of the same size, 24 ft. by 18 ft., and 14 ft. high. Each man mounting guard should have 600 cubic feet of space. There are five guard-house cells, size 10 ft. by 8 ft., and 10 ft. high=800 cubic feet each. The provost prison cells are 900 cubic feet. The yard for the guard has attached an ablution bench for two basins, also two latrine compartments, and two urinals. In the prisoners' yard there is a water tap to wash at, and one-half the conservancy accommodation is here provided as for the guard. Both the guard-room and prisoners' room are fitted with a plank bed for 12 men, estimated to allow of 2 ft. for each man to lie upon. Of the discomforts necessarily connected with prison life, apparently none are so disagreeable as those which are due to the plank bed, yet this is an infliction to which soldiers on guard are subjected. The guard bed is of the same pattern as a prison bed. Perhaps it adds to the vigilance of the guard and keeps them alert. Perhaps it also adds to the number of desertions. Soldiers do not complain of the guard bed, because they are soldiers. One guard bed is as good as another, and all are of a regulation pattern, so there is, from an essentially military point of view, nothing to complain about. Guards as military duties differ materially from civil duties of a similar character.

Soldiers are not to take off their accoutrements while on guard. M.Os. have frequently pointed out how night guards, conducted as they are, tell upon the health of the men. In all sanitary and sick returns the number of nights the men get in bed are to be stated.

**Relief of Sentries and the Supply of Coffee to Men on Guard** is ordered as follows:—

Sentries will be relieved every two hours; in cold or inclement weather they may be relieved every hour during the night. Regimental arrangements should be made for a cup of hot coffee to be provided at night (for instance, at 1 a.m.) for each man of the guard, the expense to be borne by the funds of the canteen or grocery shop.

It is desirable that a M.O. should inquire concerning the latter portion of this order, which is frequently omitted to be carried out. In some cases cocoa might be substituted for coffee; it is more easily prepared. However, the regulations say coffee.

Drying closets might with advantage be attached to the guard-room for the drying of clothes of men when they come in from a turn of duty, and also those of men who are brought in on wet

nights and confined in the prisoners' room. There is a stove for warming the prisoners' room and cells and a grate in the guard-room.

**Bedding and Exercise of Prisoners.**—Prisoners in confinement for trial by court-martial are allowed bedding up to the time of the promulgation of their sentence or of acquittal; and if in confinement pending inquiry, should their detention exceed two days. Men detained for 48 hours—two days—should be allowed their great-coats and blankets at night. In severe weather prisoners are allowed such bedding as may be necessary. Prisoners detained under charge of a guard are to take such exercise as may be deemed requisite for the preservation of their health.

**Appropriation of Barracks.**—The purposes for which each building is appropriated is lettered on the door, but the detailed appropriation of each room and hospital ward is no longer marked upon the doors. The regulations state the O.-in C.-B. is to keep a record, on A.F. K 1251, for each barrack and hospital, showing the dimensions and construction of each room. The necessary information will be obtained from the C.R.E. The O.-in-C.-B. will furnish a copy of this record to the C.O. in each barrack, for that barrack, and to the S.M.O. at the station for each barrack and hospital.

In India, in each room occupied by troops, a board is directed to be hung up, on which is stated the cubic contents and superficial area of the room and number of men to be accommodated in it.

The system of drainage in connection with the barracks and hospital, and in the vicinity of these buildings, is information which should also be placed at the disposal of the S.M.O. These ground-works are not unfrequently the source from which disease emanates, although the pioneer sergeant may be sprinkling various powders about the barrack-yard, and, as he thinks, disinfecting and deodorising all before him.

**Warming Barracks.**—One-half the air admitted to a barrack-room is supposed to be warmed previous to entering the room. This air is warmed by means of Galton's ventilating stoves, of which there are three sizes; another fire-place acting on the same principle is supplied to married soldiers' quarters, but this pattern, in addition to warming and ventilating, is adapted for cooking. *See* p. 210.

**The Allowance of Coal or Coke** for warming 600 cubic feet of barrack-room space in winter is, say,  $3\frac{1}{2}$  lbs. for 24 hours, or one day; this would be at the rate of something over three rations per man. But an estimate for the supply of fuel obviously cannot be framed upon this; it would be too low a unit to base it on. So the zero point upon which estimates for warming all confined War Office space are framed is, 40 lbs. of coal in winter for 7,200 cubic feet of space, or the space for 12 men. This applies to barrack-rooms, hospital wards, churches, etc. Smaller spaces,



for fewer occupants than 12, have special allowances. The consumption of fuel in one grate for a small space will be proportionately more than in a large barrack-room for 28 men with two grates; consequently a small room for from one to five men is allowed 18 lbs. of coal.

C.Os. now keep a running account for fuel with the supply department, so that they can regulate the issue, subject to certain restrictions as to allowances. As to quality, coal is inspected by the officer in charge of the supply when he receives it.

In wooden huts at home stations an increase of one-third, and in permanent barracks in Ireland of one-quarter more coal, may be made on the regular allowance.

For a N.C.Os. guard in winter 75 lbs. of coal are allowed, but during unusually cold weather this may be increased by 10 lbs. a day for each grate; one grate is the normal allowance for a room for from 1 to 12 men, whether guard or barrack-room.

On wet days in summer, when no fuel is allowed, 40 lbs. of coal and 1 lb. of wood may be issued.

A reasonable extra issue of fuel for any sudden emergency, such as drying damp rooms, or the clothes of men coming in off a march, may be made on the authority of the G.O.C., but no increase of cooking fuel can be sanctioned. As the quantity of this fuel depends on the apparatus used in cooking, and cannot be influenced by the foregoing or any other conditions, it is a fixed one, not to be deviated from.

Although in any case quite unnecessary for a M.O. to recommend the quantity of fuel required for warming barracks, he ought to know the principle adopted upon which the issue of fuel for warming purposes is based, namely, the warming of confined space and not the occupants of the space. Although this is the object aimed at, he should also know what can be got within existing regulations whenever he considers an extra issue of fuel necessary for the preservation of health. The dryness and warmth of habitations are matters of such great hygienic importance that they should never be overlooked.

Nettleton's stoves are the ones chiefly used by the War Department for warming purposes. They burn coke, not coal. The stove body is of Bessemer steel, with an inner lining of wrought iron; between these a layer of fire-brick is placed; of these stoves there are many sizes. The amount of cubic space each is intended to warm, and the quantity of coke required, is laid down in the Al. Reg.

Coke should not be burnt in an open grate, as carbonic oxide—the most subtle and poisonous of the gases of combustion—will be likely to get into the room. Neither should it be burnt in a cast-iron stove, as it is so porous as to allow of its escape. Moreover, a very great loss in heating power may be effected in this way. This gas is the result of imperfect combustion, chiefly due to the illuminating gases having been extracted

from the coke. Anthracite, of which Kilkenny coal and so-called "blind coal" are examples, when used for warming purposes, should also be consumed in stoves constructed of rolled or wrought iron, or of steel.

**Lighting of Barracks.**—The gas-burners ordinarily used in barracks consume three feet of gas in one hour. One foot of gas is allowed for illuminating 1,000 cubic feet of barrack-room space. In the lighting of some barracks there is much room for improvement. *See Fuel and Light in Hospitals.*

**Painting and Lime-washing** are matters of sanitary importance; they are duties relating to the R.E.Dep. The regulations for the R.E.Dep. state that barracks and hospitals are painted externally once in four years, and internally every eight years.

**Lime-washing**, wherever practicable, must be done by the troops. Barracks should be lime-washed at least once in every year; hospitals generally every six months. The colouring and whitewashing of hospital wards may, on the requisition of the M.O., be executed at intervals of not less than six months. No part of a barracks should be lime-washed oftener than every six months, unless in case of sickness, "except latrines or urinals, but should not be resorted to in the latter case for cleansing purposes, as they should be kept clean by the use of water and birch-brooms." "Rooms will not be repapered or repainted after sickness without the previous sanction of the C.-in-C., except in the case of scarlet fever, puerperal fever, or diphtheria." It is well to note these regulations, as M.Os. are often asked to back up intermediate requisitions for lime-washing on sanitary grounds. Whenever the troops wish to have their barracks whitewashed, a requisition should be forwarded by the O.C. to the R.E.Dep., on A.F. O. 1778, for the necessary materials, brushes, and plant.

Soldiers get one penny an hour while whitewashing buildings not in their occupation, such as the hospital. Each man ought to do 80 yards a day, using half a cubic foot of lime.

The employment of soldiers on R.E.Dep. works is optional with the men. When so employed the price for performing the piece of work should not exceed half the cost of civil labour.

The following is from the Commission Report, 1860:—

"Rooms with filthy saturated walls are always unwholesome, and are nurseries of epidemic disease. The plaster absorbs organic matter, and thus tends to purify the air of an unventilated room; but at length the plaster can take up no more; what is in it already becomes putrid, and the smell of such rooms is as characteristic as it is offensive, while it indicates that the contained air is unwholesome and the room not fit for habitation."

**Sanitation of Barracks.**—The C.O. of a corps is responsible for the sanitary state of his lines and the conservancy arrange-

ments. The following concerning the sanitation of barracks, chiefly taken from regulations on the subject, may be useful. The references here made will apply to the barrack branch of A.S.C. :—

The cleanliness and sanitary state of barracks being a matter of the utmost importance to the health of the troops, the O.-in-C.-B. will note at his inspections, and bring to the notice of the C.O. in the barracks, any want of attention to these matters on the part of the troops, and will also make any suggestions which may tend to promote the object in view.

He will instruct his barrack sergeants to see daily, and report to him, whether proper attention is paid by the contractors to the emptying of the latrines, ash, and dung pits.

When barracks are occupied by troops, the keeping clean of the parades, yards, and drains, and the disinfecting of ash and soil pits devolves upon them, but in the event of a barrack being unoccupied, it will be the duty of the O.-in-C.-B. to apply for such labour as may be necessary for this purpose.

Where flushing apparatus exists, it will be in charge of the troops, and the service of flushing will be carried out by them.

Where earth closets exist, the O.-in-C.-B. will be responsible that a due supply of dry earth is furnished by the contractor, and that the soil is removed by him daily if necessary. See *Instructions for Working Dry Earth System, Appendix I.*

Instructions for the use and cleansing of latrines with Macfarlane's and Jennings' fittings, and for cleansing of urinals, will be found in *Appendix II.*

Ash-pits should, as a rule, be emptied daily, soil-pits and sewage tanks on the requisition of the O.C. in the barrack, or officer in charge or occupation of the building to which they are attached, whenever it may seem necessary to him and to the O.-in-C.-B. that the service should be performed.

The discharging of ash-pits, drains, and urinals will be performed by the troops in occupation of barracks.

The Q.M. should see to this as conservancy officer of the regiment. Quicklime for purification of ash-pits and surface drains will be supplied by the O.-in-C.-B. on requisition from C.Os. made on A.F. F 732, which, when certified by the officer who issues the article, will serve as a voucher for the expense in the accounts of the district paymaster.

This lime should be obtained from the Royal Engineer triennial contractor. Fifteen grains of quicklime is required for one gallon of sewage.

"Cupralum," "terebene powder," or "carbolic acid" will be used for disinfecting latrines and urinals. It will be purchased locally by the O.-in-C.-B. on the requisition of the O.C. in the barrack, countersigned by the M.O. as to the necessity for the issue, and will be included in the monthly schedule of expenditure.

“When ‘cupralum’ is used it should be in a diluted and well-mixed state—one table-spoonful of the powder to one pint of water being the proportion.”

To sprinkle the powder about, as is frequently done, is simply to waste material. If used in zinc buckets or tubs it will destroy them.

*Terebene* is a hydro-carbon derived from turpentine by the action of sulphuric acid.

*Ferralum and Cupralum*.—These consist of either sulphate of iron or sulphate of copper, with ammonia, sulphate of potash, dichromate, and terebene.

*Calvert's* powder contains 20 per cent. or more of carbolic acid mixed with alum, the refuse of alum works, and some silica.

*M'Daugall's* powder contains 33 per cent. of carbolate of lime and 59 per cent. of sulphite of magnesia. It is alkaline on account of the lime. These are the two principal carbolic acid powders in use. They differ materially in composition, and are equally efficacious. The objection to the use of carbolic acid as a deodorant is its strong and disagreeable smell, which tends to mask other smells of a dangerous nature.

*Sulphate of iron*—green copperas—either in a strong solution of 1 to 5 or 10 of hot water, or in the form of powder, made by powdering the crystals after they are thoroughly dried, is a powerful disinfectant and deodorant, and may be used freely in the removal of filth accumulations, or in cess-pits or ash-pits.

*Sanitas*.—“The substance advertised as *sanitas* is a hydro-carbon derived from turpentine acted upon by steam. It has the advantage of being easily miscible with water, but it is not very powerful.

“The remarkable power shown by *salicylic acid* in arresting fermentation, and its value in the antiseptic treatment of wounds, would seem to indicate it as a good agent, but it is at present too expensive for use on a large scale.

“It must be remembered that deodorisation is only possible within certain limits, and that in a number of cases only partial results can be obtained, unless very large quantities of the deodorant are used. The most effectual appear to be the terebene preparations, especially the cupralum, and carbolic acid and its preparations. Of these the cupralum has the advantage of destroying hydrogen sulphide and neutralising ammonia, which are only masked by the others. Chloride of lime and chloride of soda are also powerful, but have themselves a sickly odour, very disagreeable to many persons. The Süvern deodorant is probably the next best, and after that the ferric chloride ( $\text{FeCl}_3$ ).”—*Parkes*.

*Süvern's* deodorant is composed of coal-tar in the proportion of 10 lbs. mixed thoroughly with  $1\frac{1}{2}$  bushels of quicklime.

Perhaps there is no more valuable disinfecting solution than that made with perchloride of mercury. Dr. George Buchanan,



M.O., Local Government Board, gives the following instructions for its preparation for general purposes:—"A solution fitted for the desired purposes may be made with  $\frac{1}{2}$  oz. corrosive sublimate, 1 fluid ounce hydrochloric acid, and 5 grains of commercial aniline blue, in three gallons (a bucketful) of common water. It ought not to cost more than 3*d.* the bucketful, and should not be further diluted. The use of non-metallic vessels (wooden or earthenware house tubs or buckets) should be enjoined on those who receive it, and articles that have been soaked in it should be set to soak in common water for some hours before they go to the wash." See p. 301, **Infectious Diseases Occurring in Barracks.**

**Arrangement of Barrack-rooms.**—The windows of barrack-rooms are to be opened to allow a free ventilation as soon as the men have risen, and are to be kept open during the day whenever the weather and season admit. The bedsteads are placed at a distance of six inches from the wall. Before the bedsteads are to be turned up the bedding is to be left exposed to the air for an hour every morning. The beds and bedding are to be removed from the barrack-rooms during fine weather for the purpose of being aired; in huts this should be done once a week.

**Beds Temporarily Vacated.**—The beds of soldiers in hospital, in cells, or on short furlough (not exceeding a fortnight) will be considered as occupied, and consequently not available for other soldiers. As a rule, by counting the number of beds you find the number of occupants in a room.

**Bedding.**—Soldiers in barracks are supplied with one palliasse, one bolster case, two sheets, and three blankets. The barrack bedding is changed every 90 days, the sheets once a month, and the blankets once a year. 24 lbs. of straw are allowed for filling the palliasse and bolster in barracks, and 28 lbs. when straw beds are used in connection with the treatment of disease. Oaten straw is the best for bedding. In Egypt the order is that sheets are to be changed every 14 days during the summer months.

**Washing Floors and Forms in Barracks** are only allowed once a week, and should take place early in the morning, so that they may have the whole day to dry. It would be well to omit the washing altogether on rainy or damp days. On every intermediate day the barrack-rooms are only to be dry scrubbed.

In the last issue of the Q.R. it is added—"To avoid unnecessary soaking of the floor and damage to the ceiling of the room below as little water as possible should be used." Whether there happens to be a room below or not the almost universal practice of saturating the boards with water and the atmosphere of the room with moisture is very objectionable. The attention of C.Os. ought to be directed to this, as barrack-rooms are rendered unhealthy by the use of too much water in washing

them, and this is a matter of far more importance than any injury that may be done to the ceilings.

*Washing or drying of clothes* in sleeping-rooms in barracks is also forbidden, as it may "tend to prevent cleanliness." See *Standard Atmosphere and Moisture in the Atmosphere*.

Sanding the floors of barrack-rooms or covering them with saw-dust only loads the air with dust impurities without real cleanliness, and ought not to be allowed. In all trades where men inhale silicious dust there is a high rate of lung disease. Using large quantities of pipe-clay in cleaning white jackets in the Guards and Highland regiments, an atmosphere is created which acts injuriously on the lungs.

Barrack-rooms to appear clean and tidy, and to be really clean and tidy, are different things, as many articles are merely hid away and kept out of sight. There are special tubs allowed for washing out the floors, and the filthy and unhealthy habit of using the urine tubs for this purpose should be stopped wherever it exists.

*Urine Tubs.*—Urine tubs are sometimes employed to mix lime in for whitewashing, and this, by reason of holding putrescent animal matter in it, causes foul air to be exhaled into the room.

**Animals Prohibited in Barracks.**—No such animals as cows, pigs, or goats are to be kept, nor are horses, dogs, or poultry to be suffered to stray or run loose within the boundaries of barracks or hospitals. Immediate attention is to be paid by C.Os. to any representation made by the O.-in-C.-B. of an infringement of this order.

It is very difficult indeed to prevent British soldiers from having some sort of pets about them, especially abroad. The order intends that all birds and animals should be kept within reasonable control. I had charge of negro regiments for five years in the West Indies, and in this matter I noticed a striking contrast between the soldiers of the two races. Where there are no national affections there can be but little *esprit de corps*. See p. 377.

**Canteens.**—The following concerning canteens may be found useful, not alone to the M.O. in charge of a regiment, but also to the O.C. a detachment of the M.S.C. Canteens are shops established in barracks exclusively for the use and convenience of the troops; in them are sold various articles of food, stationery, etc., and liquor.

The sale of spirituous liquors in canteens is strictly prohibited at home, but at foreign stations the sale of spirits is permitted at the discretion of the C.O.

Neither intoxicating or malt liquor is to be sold before 12 o'clock noon, nor after tattoo (10 o'clock, p.m.), nor during the hours of divine service on Sundays; nor at any time to any one appearing to be intoxicated. *Defaulters* are to be permitted to enter the canteen only for one hour in the day, as a rule in the evening.

Civilians are not to purchase any article at the canteen without permission of the O.C., and under no circumstances will they be allowed to enter the canteen during the hours prohibited by the Licensing Acts.

Canteens are conducted either on the tenant system or regimental system. The tenant is a civilian; he pays rent weekly, and his agreement terminates at one week's notice. At home stations the appointment is made by the O.C. the regimental district; abroad, by the G.O.C., and the tenant can only be removed by his authority. These canteens, as a rule, are garrison canteens.

**The Tenant** is to produce samples of the liquors and other articles retailed by him, and a list of the prices at which they are sold, in order that a garrison board of survey—consisting, if possible, of a field officer, a captain, and the O.-in-C.-B., with a military M.O. in attendance—may ascertain every three months, or oftener if necessary, that the articles are of good and proper quality for the use of the troops, and that the prices are fair and reasonable. The schedule of articles, with prices entered in ink, is to be conspicuously hung up in the canteen and grocery shop.

To enable the tenants to sell with advantage to the troops and without prejudice to their own interest, they are granted a monopoly of the sale of articles within barracks to soldiers, but this does not extend to sergeants' messes nor to recreation-rooms.

**Regimental Canteens** are managed by a standing committee of three officers—the president not to be under the rank of captain. The C.O. is not to be on the committee if there is one captain available for it. Presidents of canteen committees are, when practicable, to be exempted from serving upon all boards of survey, court of inquiry, and courts-martial. The members of the committee are to be selected by, and be under the direction and control of, the C.O. No officer of the regimental staff is to be appointed a member of the regimental canteen committee.  
—Q.R.

Under the committee a manager will be appointed in charge to act as storekeeper, steward, and salesman; the receipts he hands in daily to the committee. "The regimental system is not considered applicable, as a general rule, to a single battery of artillery or a company of engineers, or to any detachment which cannot furnish the requisite number of officers for the committee."—Q.R.

Detachments of the M.S.C., as a rule, are attached to the garrison canteen by local arrangement; all soldiers using a canteen participate in the profits; a regimental canteen fund by regulation should not exceed 50*l*.

**Canteen Profits** are to be used exclusively for the benefit of the soldier or his family for recreations, games, and amusements. None are to be spent upon outside charities or for religious

purposes, or the purchase of regimental clothing or equipment, or to defray travelling expenses, or the cost of Government property.

The profits may go towards, as well as other things, extra messing on Christmas-day, refreshments on field-days, hot coffee for men on guard, reducing the cost of messing, the provision of whitewash brushes, lime for whitewashing, sawdust, etc., for the men's barrack-rooms, and extra fuel for drying-apparatus.

"Nothing is to be allowed to be taken out of barracks to officers or men unless on written requisition. Malt liquor may be taken from the canteen to the barrack-rooms for the men's consumption at dinner."

With this exception all other liquors must be drunk on the canteen premises.

**Visiting.**—"The canteen is to be frequently visited by a member of the canteen committee, by the C.O., and by the orderly officers, to see that no irregularity takes place. A M.O. should also be instructed to visit the canteen occasionally, and to ascertain the quality of the articles sold."

The men ought to have their beer at dinner, and not be obliged to run off to the canteen immediately after dinner for a drink. The adoption of this latter system encourages the men to remain in the canteen drinking during the afternoon.

The canteen is not a health resort, but the reverse of a hygienic establishment, although classed as "wet and dry." The former has but little to do with hydropathics; here moisture means the malt liquor which supplies the "wet."

It is a principle in taxation that intoxicating liquors are more heavily burdened than the necessities of life. At present, drink is the only article in a canteen which is sold below the ordinary retail price. This departure from a general principle undoubtedly tends to encourage drinking in the canteen in preference to public houses, but it also creates or develops a taste for liquor beyond the canteen limits; thus this system directly and indirectly engenders a habit of drinking. *See p. 250.*

If malt liquor was sold in canteens at public-house prices, it has been reckoned that the receipts from a regiment 800 strong would be increased by over 40*l.* a month; and if this sum was judiciously laid out on food as extra messing, it would come back to the soldier in a direct and most profitable way. This would be an inducement for him to spend his money at home. The difficulty is, although not a great one, that the toppers would tend to provide for the temperate. But if the toppers cannot be got rid of out of the army, this might have the effect of discouraging excesses quite as much as the present system of fining, which causes a loss of money to the regiment.

**Sergeants' Mess.**—A sergeants' mess is established as one of the means of adding to the self-respect and comfort of sergeants. They are institutions which should be visited by M.Os. inspecting



barracks. At some stations, sergeants' messes are allowed for the M.S.C., and the following remarks apply equally to them. Where it is impracticable to form a sergeants' mess, the reasons which may prevent its adoption are to be explained at the annual inspection.

The C.O. is directed to keep a constant supervision and control over the sergeants' mess, and to see that it is conducted with strict economy, regularity, and order. In regiments the immediate supervision is vested in the adjutant.

**Members.**—All regimental warrant officers, staff-sergeants, and sergeants, whether married or single; lance-sergeants not receiving pay as such have the option of joining. Honorary members not below the rank of lance-sergeant may be admitted, with the sanction of the C.O., but they should be limited in number.

**Subscriptions.**—Members pay an entrance fee not exceeding three days' pay on appointment, and on promotion the difference of three days' pay. A monthly subscription may be charged, not exceeding 1s. 6d. for unmarried, and 9d. for married or detached members.

**Mess Meetings.**—Mess meetings are held monthly, at which all members attend. The sergeant-major presides; he is responsible for good order and the due observance of the rules of the mess. The minutes of these meetings are submitted to the C.O. for approval.

**The Committee.**—A committee is appointed quarterly for the management of the mess. A sergeant not one of the committee is appointed caterer; a treasurer is also appointed by them. The committee check the accounts, and after they are certified as correct by the president, and all bills paid—the treasurer pays the bills after they are signed by the president—the accounts are laid before the C.O. by the 5th of the month following. 5l. is the limit of the balance which should remain in the hands of the committee; any sum over this should be held by the paymaster.

Messing is not to exceed one shilling a day. Liquor is on no account to be sold to a private or to any one not a member or honorary member of the mess, and never before the hour of forenoon parade.

Owing to some cause or other, sergeants' messes, in all branches of the service, have become an evil notorious and fraught with much mischief to N.C.Os. and men. Major J. W. Baxter says:—

“Perhaps no regimental institution gives a zealous C.O. and a conscientious regimental sergeant-major so much trouble as the sergeants' mess. The institution is intended to be ‘one of the means of adding to their (the sergeants') self respect.’ It is very much to be feared that, in many cases, instead of doing so it

does the very reverse, and that much drunkenness and tippling is encouraged by this institution, not only among the sergeants themselves but also among the men.

“The fact is to be very much regretted, but it nevertheless is an undoubted truth, that too often the cupidity of the caterer and other N.C.Os. connected with the management of a sergeants’ mess, soon gets the better of their self-respect.”

After stating that money is made so frequently in an incredibly short space of time “that the fact has ceased to excite any surprise,” he goes on to say—“Apart from the abstract evil, the impunity with which money may thus be made, and the fact that such doings are looked upon as almost a matter of course, have a most demoralising effect upon young sergeants, who are frequently found eagerly looking forward to the time when they, too, will have what they openly call ‘a chance’ of making money in the same way.

“And how is this done? Simply by drinking and encouraging drinking. In too many instances to mention, the sergeants’ mess is little else than a dram-shop in barracks. The individuals who should be the mainstay of order among the rank and file, and who should check the propensity for drink where it exists, enlist the men as customers to increase their gains; for it is perfectly well known that from many sergeants’ messes liquor, including spirits, may be freely obtained at all hours by private soldiers who know where to apply for it. It is hardly necessary to say after this that in these places the rule concerning no liquor being sold to sergeants before forenoon parade is not very strictly observed, and that, be he sergeant or be he soldier, no man who fancies a morning dram need forego his tastes if he has a few coppers to pay for it.

“The practice has ever been systematised in some of these messes; a regular predetermined tariff of prices is in force for private soldiers, the rule being that the private pays about half as much more than the mess price for liquor thus obtained surreptitiously. Obviously, here is a rich source of extra profit which will not have to be accounted for.

“Frequently also civilians are admitted to sergeants’ messes, nominally as *guests*, but really as *customers* for drink.”

#### **Food with respect to Regimental Administration.—**

Soldiers’ food in peace time comes from two different sources of supply; one portion is provided by the Government free of cost, and the other portion, for which the soldier pays, is obtained regimentally; but once the issue of the Government ration is received, the entire system of distribution and preparation of food is conducted under regimental administration, and it will be seen that the regimental authorities are chiefly, although not exclusively, responsible for the good or indifferent quality and sufficiency of the messing in a corps.

It is a good principle to oblige a man to bear some of the expenses of his living ; while deriving immediate advantages from his expenditure, and thus exercising a partial control over his own well-being, an increased responsibility should be felt, which, if properly directed with due regard to economy, ought to tend towards frugality, contentment, and a disposition to observe good order and discipline. The value of a Government ration is stated at 6*d*. Now to give regiments this allowance in lieu of free rations, and let them exercise complete control over their food supply, would not answer with any cosmopolitan army ; one effect of such an arrangement would be that the supply department of A.S.C. would fall completely into disuse, and could not be resuscitated on the outbreak of war.

**Barrack Rations.**—Soldiers in barracks receive a free ration of 1 lb. bread and  $\frac{3}{4}$  lb. meat. All warrant officers at home, N.C.Os., and men on pass or furlough, soldier servants allowed to accompany their masters on leave of absence, soldiers employed on the recruiting service, and a few others under special circumstances, are struck out of messing and permitted to draw a money allowance in lieu of rations.

Men in billets drawing travelling allowance, in hospital, in prison, or absent from their corps, are “struck out of mess.” Many who draw rations are also “out of mess.” The regimental Q.M. sends in daily to the O.-in-S. an account of returns on A.F. F 746. In this form are shown the receipts up to date ; it also serves as a requisition and voucher.

**Back Rations** are on no account to be issued. Rations in kind which are not claimed in the month to which they belong must be considered as back rations ; by not looking out for this contingency regiments may be deprived of much food.

**Rations for Soldiers' Wives.**—Soldiers' wives and families receive rations on foreign stations only— $\frac{1}{2}$  a ration for a wife, and  $\frac{1}{4}$  for a child up to 14 years of age ; but the wives and families of soldiers invalided to Netley or Woolwich receive rations so long as the soldier remains in hospital, provided they are on the married roll of the regiment.

**Ration Board.**—After the meat tendered for issue by the contractor is passed by the O.-in-S., it is inspected in bulk by a board of officers, the president of which is a field officer. After this inspection the meat is distributed to the corps, but the contractor is responsible for its condition until finally accepted. The Q.M. is responsible that he receives the correct quantity, but is not directly responsible for the quality of the supply ; yet he should draw the attention of the orderly officer, who attends at the ration stand to see the meat cut up, to any bad or inferior portions not up to contract that may be sent to the regiment. In the event of the O.C. a corps objecting to receive the meat tendered for issue, application should be made for a garrison board to

inspect and report on it. A M.O. attends at these boards, either to be examined as a witness or state his opinion, as the president of the board may direct.

The officer inspecting the bread should never neglect weighing some loaves other than those placed in the scales to await his arrival at the ration stand. *See Conditions of Contracts for Meat and Bread.*

**Quality.**—It is an important and responsible duty to say whether meat is good and wholesome and fit for issue or positively injurious. There is a wide range between these conditions. In India ration meat containing “cysticercæ” is ordered to be retained, but it must be thoroughly cooked. As well as being unfit for food on account of the beast having been diseased, meat may be injurious by reason of the poisonous nature of substances eaten by the animal, or drugs administered; or, originally good, it may become unwholesome through decomposition. Again, meat may be fresh, sound, and not unwholesome, and yet be deficient in many respects and not up to contract (*see* p. 236). The flesh of young animals is deficient in many qualities that are found in the full-grown ox of from three to eight years of age; it is less rich in substances, and loses, according to Parkes, as much as from 40 to 70 per cent. in cooking. The contract limits the age of oxen at from two to eight years, and sheep from two to four years. Mutton is usually issued on one day in the week. *See* p. 239.

**Quantity.**—Of the  $\frac{3}{4}$  lb. of meat supplied 25 per cent. is bone or uneatable or indigestible substances. In cooking, ration meat loses about 25 per cent.; so the 12 ozs. originally issued is represented by 6 ozs. of what might be called oxidisable alimentary substance; and this, together with 1 lb. of bread, constitutes the Government free ration. The soldier has the privilege secured to him of purchasing at contract rates  $\frac{1}{4}$  lb. more meat, and the same amount of bread, but this comes under the head of extra messing. There is no provision made by the War Office for the issue of either vegetables or milk in barracks. On some occasions in camp a soldier may be supplied with the Government grocery ration, for which he pays 1½d. each ration.

**Extra Messing.**—The staple commodities of bread and meat, though obviously insufficient to constitute a complete ration, become the basis upon which the mess caterer can calculate when arranging the company messing. In order to assist him in supplying the deficiency, the class of articles and proportions in which they will be required is stated in his messing account book.

The following scale of messing in the service, for the guidance of orderly corporals, is directed to be adhered to as far as possible:—



**For Each Meal.**

Tea	-	-	-	-	-	1 oz. to 6 men.
Coffee	-	-	-	-	-	1 oz. to 3 men.
Sugar	-	-	-	-	-	1 oz. to each man.
Milk	-	-	-	-	-	$\frac{3}{4}$ pint to 6 men.
Potatoes	-	-	-	-	-	1 lb. to each man.
Mixed vegetables	-	-	-	-	-	$\frac{1}{4}$ lb. to each man.
Onions	-	-	-	-	-	as required.
Flour, barley, or oatmeal (for soup)	-	-	-	-	-	1 oz. to each man.
Peas (for soup)	-	-	-	-	-	$\frac{1}{4}$ lb. to each man.
Salt	-	-	1 oz. to each man	for cooking	and mess tables.	
Pepper and mustard	-	-	-	-	-	as required.
Flour (for a meat pie, etc.)	-	-	-	-	-	4 ozs. to each man.
Suet (for meat pie, etc.)	-	-	-	-	-	1 oz. to each man.

**THERE WILL BE REQUIRED**

For a bake—Onions.

For a stew—Onions and mixed vegetables.

For a soup—Onions and mixed vegetables, flour, or barley, or oatmeal.

For pea soup—Onions and mixed vegetables (including celery and dried mint).

Currie stew and rice—1 oz. of currie to 3 men, onions, mixed vegetables, rice,  $\frac{1}{4}$  lb. to each man.

Plain duff—Flour  $2\frac{1}{2}$  lbs., suet 10 ozs. for 10 men.

Plum duff—1 lb. raisins or currants in addition.

The orderly corporal of each company sends in every morning to the canteen steward his requisitions for the day's supplies. When ready for delivery the bugle sounds for orderly corporals, who attend with the orderly men of each mess. After seeing that the issue is correct, it is handed over to the cook. The daily messing account in Army Book 48 is signed daily by the canteen steward and the N.C.O. in charge of rations. At the end of each month the book is signed by the O.C. the company or detachment, as is the case in the M.S.C. This officer certifies that the messing money has been properly expended during the month. The amount expended on extra messing is usually  $3\frac{1}{2}d.$  a day per man, and this sum judiciously laid out, when economy is practised with due regard to the interests of the soldier, is found sufficient to give him, under ordinary circumstances, enough of good wholesome food.

At present it appears far too much is left to the orderly corporal, who obtains extras and looks after the messing of the men. The soldier's messing varies according to the tastes of the different messes and the care and supervision to which it is subjected. The composition and nutritive value of the soldier's food will consequently vary much, as it is not issued out according to any fixed scale. The foregoing is a different and an inferior scale of diet to that adopted by Dr. Parkes, when estimating the scientific value of a soldier's food with regard to

the energy obtainable from it if entirely consumed and metamorphosed within the body.

The quantity of uncooked food, composed of the free Government ration and the grocery ration obtained at  $3\frac{1}{2}d.$ , taken together, in case the messing is well looked after in a regiment, is not less than  $3\frac{1}{2}$  lbs. a day of so-called solid food, which is served up in a palatable and digestible form. Parkes says the total of solids and fluids required by a man is  $\frac{1}{2}$  of his weight, about  $\frac{2}{3}$  solids and  $\frac{1}{3}$  liquid. In a standard diet the proportion is albuminates 1, fat 6, carbo-hydrates 3, or say 300 grs. nitrogen to 4,600 carbon. So far then as weight or bulk is concerned, the soldier in barracks ought to have nothing to complain of; but as well as quantity and quality, the nature, composition, variety, digestibility, preparation, and other questions relating to the food itself, are of great importance, while the power of the individual to assimilate and convert it to his own use must also be taken into account as a matter of primary importance. It is only to the extent that the soldier is capable of utilising food and converting its potential into actual energy that he is able to retain his health and vigour and perform work.

**Cooking.**—In order to enable the soldier to get the full benefit from the means afforded for preparing and varying his diet, a sergeant-cook is appointed to each regiment and battalion. These are efficient men, but require looking after. They should not be appointed caterers to the sergeants' mess, or on any employment likely to divert their attention from their special duties.

**The Issue of Fuel for Cooking** is regulated in a measure according to the description of apparatus in use in the service. Different means of cooking are employed according to the number of men provided for.

*Warren's cooking apparatus*, the one usually employed in barracks to cook for 100 men. By this means a great saving of coal is effected and the cooking can be well varied. It will cook at the same time in five different ways; (1) the meat can be boiled and soup made; (2) meat puddings can be steamed; (3) the meat can be Warrenized, which means cooked under a process by which it is said the juices are retained in the meat more than by any other method; (4) pies or joints can be baked; (5) curries or stews made, and potatoes or other vegetables steamed.

*Grant's apparatus* takes 2 lbs. of coal for each man a day under 200 men; with a little more coal it would cook for 500. With the *Canadian stove*,  $1\frac{1}{2}$  rations of coal for each man a day, and  $\frac{1}{2}$  ration of wood for each stove a day. With *Dean's apparatus* the allowance is  $\frac{1}{2}$  a ration for each man a day. For detachments under 60, with a 25 gallon boiler, 30 rations a day; with a 15 gallon boiler, 20; with ordinary boilers of 25 and 15 gallons, set in the usual way, an allowance of one ration for each man a day is made.

Parkes says, if a M.O. be asked an opinion as to the amount of fuel required for cooking, he can take as a standard for an ordinary good apparatus  $\frac{1}{2}$  lb. per man per diem. This is certainly within the regulation allowance. Taking it all round, in camp and quarters, it would be more correct to say a ration of fuel is required to cook a ration of food.

"To cook rapidly and well is an art which can be easily acquired and which every soldier should learn. C.Os. of companies should see that there are a certain number of men (at least 8 or 10) in their company who have been instructed in cutting up meat, in making field kitchens, and in cooking.

"The sergeant-cook is specially trained for the purpose of instructing men in this essential portion of their duty, and C.Os. of companies should see that the company cooks *really* learn these things. It is a matter of paramount necessity that soldiers' food should be carefully looked after. This duty should never be left to a N.C.O., but should be carefully attended to by the company officers themselves."—*Regulations and Instructions for Encampments*. See p. 404.

The loss of meat by roasting, boiling, or stewing, varies from 20 to 35 per cent., according to the quality of the meat, and mode of procedure in cooking. The loss is chiefly water. The great fault in cooking meat is the employment of too high a temperature. If cooks are pressed for time by reason of being employed on other duties, they will hurry up and spoil the dinners. Roasting should be slowly done. In boiling, the meat should be plunged into boiling water to fix the albumen near the surface, and thus retain the juices in the joint; after this, the temperature should be kept about 160°.

In a dietary monotonously regulated, variety in cooking will tend to answer for variety in food; by the application of different processes substances are physically changed, and the digestive powers are thereby stimulated. The means of cooking, although in the majority of cases satisfactory, are scarcely advanced enough.

The officers on regimental duty are to visit and inspect the kitchens and cooking apparatus daily; and are also to visit the men's barrack-rooms during the breakfast, dinner, and evening meal hours, in order to see that these meals are properly prepared, and that there is no cause for complaints.—*Q.R.*

There is no "roll-call" at the evening meal or "tea," which usually consists of a pint of tea, and half a pound of bread, served about 4.30 o'clock; it is not customary for an officer to visit barracks at this hour.

To more correctly adjust the hours at which food is taken in its relation to the work performed by a soldier is an important problem; from tea-time until breakfast next day, at 7.45 o'clock, there is an interval of many hours, during which the heaviest work of the day is usually undertaken. The dinner meal, which

is by far the most substantial one of the day, in cavalry and artillery is taken at 12.30 p.m., in infantry 12.45 p.m.

Arrangements should be made in every regiment whereby men on guard would have a good supper provided for them; they cannot go to the canteen or elsewhere to get any thing for themselves.

Corporals belong to the rank and file of the army; they mess with the men, sleep in their barrack-rooms, and are supplied with the same class of clothing, but there is a corporal's room at the canteen, where they can drink apart from the privates. It is necessary that the corporals should remain among the men as much as possible, especially where there are a number of young soldiers.

**Remarks on the Feeding of Soldiers.**—The British soldier previous to enlistment is not a large consumer of meat, and what he does take is usually in the form of fat pork or bacon; he is for the most part a bread eater and beer drinker, and likes cheese. To German pea sausages, tinned provisions, and the light wines of France he is unaccustomed. The food of the soldier, no matter to what nationality he belongs, must be in accordance, as much as practicable, with the general dietetic customs of his country. A departure from his ordinary habits in this respect on scientific or economical grounds should not be hastily adopted. The model upon which the diet of a soldier should be framed is that of the better classes, or yeomen of the nation, or more successful races of mankind, rather than the backward races or poorer persons among a community. To frame a scale of rations on a subsistence or prison diet as a basis, without due regard to other considerations, is likely to lead to an erroneous conclusion.

A body of men who mess together, like soldiers in barracks, will make their food go further than in cases where it is portioned out to individuals, as is the case in prisons. The different tastes and appetites of men exercise a compensatory effect when they are messed together; this appears to add an increase. What one would naturally expect is practically found to be the case, that the recruit, as a growing lad, and the young soldier eat more than the old soldier.

The recruit while under instruction drill does far more work than the trained soldier, who, in addition to a prematurely advanced age, generally suffers more or less from some form of dyspepsia, which naturally lessens his appetite and impairs digestion. This is an acquired disability, which ramifies through the entire army, mostly observed in the infantry of the line. This defect is due to the system under which the soldier lives, and his exposure to climatic influences, yet many of the conditions that induce it are in a measure under control of the individual; however induced, the result is the same—his food goes to the recruit or to the swill-tub.



There are comparatively more young men in the ranks now than in former years, and this may cause a call for more food, especially in dépôts, where recruits are assembled and are being pushed forward in drill and instructed under high pressure, while in all probability they are not so well cared for as they would be with their regiments, especially as regards messing. The principle of regulating food in accordance with labour should be further extended in the service. During the drill season in camps of instruction it is highly probable—in some corps, at least—the soldiers are insufficiently fed. Still under such conditions the soldier should not be called upon to contribute more money towards extra messing. It would be virtually fining him for circumstances over which he has no control.

The soldier's ration should be augmented, especially with respect to fatty substances and fresh vegetables. The diet of all armies in Europe contains too little fat. The American army is the only one correctly rationed in this respect. To supply meat to such an extent that the surplus albumen might be transformed into fat would be a very indirect, expensive, speculative, and injurious method.

We see fat, as well as being a great force-producing agent, accelerates the digestibility of other substances. This is one reason why it allays hunger, while at the same time, in a marked manner, it tends to remove a desire for drink. So fat, oil, butter, lard, fat bacon, suet, or dripping are the substances captains commanding companies should impress upon "orderly corporals," as the chief things for them to get as extra messing.

Although ignorant of the scientific value assigned to fat, the want of it in the ordinary barrack ration causes a strong desire among soldiers for this class of food, due to natural causes, and hence the use in barracks of suet-pudding and "duff" as standard articles of diet.

Again, take bread, for example, which constitutes so large a portion of soldiers' food. It has been called "the staff of life," but as it is deficient in fatty substances, it cannot be regarded as a typical food, although butter can easily supply the deficiency. And here we see instinct creates a desire for a want which science tells us must be felt. On the other hand, care should be taken that the use of fat in food is not overdone; for when taken in excess, we are told, it lessens the absorption of oxygen and impedes the metamorphosis of both fat and albumen. In pork fat is excessive, and albuminoids proportionately absent. To supply this defect peas or other leguminous vegetables should be taken with it, as is the case when troops are victualled on board ship. The adoption by natural selection of "bacon and beans" as a standard dish among the soldiers' class shows how instincts tend to provide for the wants of the body in a manner in accordance with the dictates of science.

**Fish.**—I find no mention made of fish as food in Parkes' "Hygiene"; at the same time it is extremely wholesome, nutritious, and valuable food. The disadvantage it has as an article of diet for troops is its great liability to go bad and become objectionable and unwholesome. However, such fish as Newfoundland salt cod or Finnon haddock should not be entirely overlooked as an article wherewith to supplement a soldier's breakfast; not, indeed, as a permanent or staple article of food, but on the score of variety. As fish contain a large quantity of water in their composition, dried fish is reckoned as having almost double the nutritive value of fresh fish.

The fish supplied for hospital diets is directed to be "white fish." *See p. 236.*

**Vegetables.**—The more general use of fresh vegetables among men in barracks is a thing which requires to be seen to. Nothing is more necessary or wholesome. Where they cannot be obtained, potatoes and onions of good quality should, if possible, be provided. "Cheese" is excellent food, but rather indigestible if taken in large quantity. About  $\frac{1}{2}$  lb. of cheese is said to contain as much nitrogenised substance and  $\frac{1}{3}$  lb. as much fat as 1 lb. of meat. A M.O. whose duty it is to visit barracks and inspect the men's food should point out to those interested in their messing the fallacy of attaching undue importance to gelatine as an article of diet. *See p. 226.*

With respect to the ration obtained on behalf of the soldier, and for which he is charged in his company accounts as extra messing, Lieut.-Colonel Tullock, C.B., "The Welsh Regiment," said in a lecture on soldiers' food, delivered at the United Service Institution:—

"As regards the other articles which make up the soldier's food during ordinary barrack life, viz., milk, vegetables, and groceries, the canteen steward and the master cook are generally the only persons who see them on issue. If these two N.C.Os. do their duty all goes well, but if there should be any understanding between either of them and the contractors, the soldier is supplied with an inferior article, or does not get proper weight," etc., etc. "The subaltern on duty visits the kitchens to see they are clean; but something more than this ought to be done by at least the captain of the week. It is just of as much consequence that the groceries and extra bread, etc., for which the soldier pays 3*d.* or 4*d.* a day, should be of good quality and quantity as the free ration of bread and meat. Bad groceries, indifferent potatoes, old stringy vegetables, and watered or skim milk will certainly be supplied by contractors unless they are looked after. As for the men coming forward if anything is wrong, there is a stronger professional pride in Thomas Atkins than most people are aware of. He considers it unsoldierlike to make complaints; as a rule, something must be very wrong indeed when he ventures to speak out on the subject of his rations."

“Officers commanding companies should look after the grocery books more than they usually do. If a pay-sergeant gets into difficulties, the grocery messing is an easy way to put himself straight, he charging the men in their accounts full messing, but not crediting it all in the grocery book.”

Where Tommy Atkins' diet is left almost entirely in the hands of unscrupulous N.C.Os., you may rely on it other matters also are left too much in their hands; consequently, besides “professional pride,” there are very many things which may influence him in not coming forward and complaining against those immediate superiors in whose power he is placed.

In a very interesting and instructive article on “Soldiers' Rations in the Nineteenth Century, December 1888,” Archibald Forbes says, with respect to the few shillings that remain over after purchasing the necessary extra messing:—“It may broadly be said that as this daily modicum of ‘messing’ surplus is judiciously or negligently administered, so the soldier lives well or badly. In a regiment where a soldier's physical welfare is cared for, the messing account book is open to his inspection, and he is consulted as to the disposal of the surplus it shows, that surplus being to all intents and purposes his own property under the limitation that it is to be expended in food of one kind or another. The O.C. the company puts his signature at the foot of the daily ledger in token of his verification of its correctness and of his interest in the well-being of his men. I am compelled to state that in the course of my investigations I have looked into the administration of regiments in which, as regards these details, there is a discreditable dereliction of duty; in which, for example, the messing account is written up only monthly, the daily budget, with the surplus or deficit unexhibited, being scribbled into a dingy scroll-book; in which the soldier is never shown the account and reckoning of the disbursement of his own money; in which the surplus is expended in the fashion that gives the least trouble, the soldier being given no voice in the matter; in which the officer's signature is conspicuously absent from the foot of the daily budget. Such shortcomings betray an indifference all the more reprehensible because so little trouble is required to establish a better order of things. What can be done for the soldier in one regiment by good system and kindly care can be, and manifestly ought to be, done in all.”

The committee appointed to inquire into the question of soldiers' dietary in 1889 state in their report:—

“We are of opinion that the chief defects in the soldiers' diet are due to the fact that it has been too much left to custom, and that too little attention has been paid to it by those in authority. We are glad to notice that increased interest is being taken in this subject by officers, and we believe that alone will go far to remedy many of the evils now complained of.

"More supervision should be exercised, not only over the supplies received, but also over their preparation for the soldiers' meals. At present it is not the special duty of any officer to do this, and we recommend that a field officer in each regiment should be appointed to supervise generally the messing of the corps, and the expenditure incurred upon it. This officer should be referred to whenever doubts arise as to the quality of supplies delivered by contractors to the regiment."

**Provost Prison.**—A M.O. must visit daily the cells in barracks in which soldiers are confined. These cells are either the provost prison cells or the guard-house cells. A military prison is a public institution. Soldiers cannot undergo imprisonment in cells until these are approved of by the Inspector-general of Prisons, authorised by a Secretary of State, or the Governor-general, if in India. C.Os. are responsible for this, but men may be detained for safe custody in the guard-house cells, or in a police lock-up if on the line of march or in billets, prior to their being tried for an offence.

The regulation size of a provost prison cell is 12 ft.  $\times$  7 ft. 6 ins.  $\times$  10 ft. high = 900 cubic feet. A guard-room cell is 800 cubic feet. The difference is due to superficial area, the height of both cells being the same. Provost prison cells are constructed at the rate of two per cent. on accommodation in barracks. The windows in each cell ought to be so arranged as to admit of their being opened in hot weather, but as this is not provided for in what might be called the sealed pattern plan, a M.O. probably will have some difficulty in having it done. Hot water is directed to be laid on to baths in prison.

**Prisoners** are received into and released from prison during the hours after dinner and before dark. The hour is fixed at different stations.

**Medical Certificate.**—Every commitment to a civil, or military, or provost prison, is to be accompanied by a medical certificate of the state of health of the prisoner. When the M.O. considers the offender unfit for the ordinary hard labour of the prison, he is to state the grounds on which his opinion is based.

**Medical History Sheet.**—When a prisoner is committed to a military prison, his medical history sheet will be sent with him. The C.O. of the prisoner will, for this purpose, obtain the document from the M.O. in whose custody it is, furnishing a receipt for the same. On the soldier's release the sheet will be returned to the C.O., who will send it back to the M.O.

**Prison Diets.**—There are four scales of ordinary diets used in military prisons. These scales are arranged so that different diets may be given to prisoners who have to undergo different terms of imprisonment. For short periods of confinement the punishment is increased by a scanty dietary, but for long sentences an increase of diet is required to sustain life. Scales



3 and 4 are the dietaries for prisoners undergoing sentences exceeding 42 days; 3 is for "without" and 4 "with" hard labour punishment. As all prisoners whose term of confinement exceeds 42 days are removed to a district military prison, no further reference will be made to them here. This is merely intended for easy reference by a M.O. visiting the garrison or regimental provost prison; the same rules apply to both institutions.

Diet scales 1 and 2 apply to provost prisons. Here there is no distinction made in the case of a prisoner undergoing a sentence of hard labour; all are dieted alike, but the quantity varies with the length of the sentence awarded. A soldier confined at the guard-room or at the provost prison, pending the result of his trial, is on barrack rations. There are, in addition to the ordinary prison diet, three scales of "punishment diet," which can be awarded by the military officer appointed as visitor to the prison on account of misconduct or breaches of prison discipline.

**Ordinary Prison Diet** in garrison and regimental provost prisons:—

SCALE 1.—Dietary for prisoners undergoing sentences of seven days or under consists of 2 ozs. bread,  $\frac{1}{2}$  lb. potatoes, and 2 pints of gruel.

SCALE 2.—Dietary for prisoners undergoing sentences exceeding seven days and not exceeding 42 is on a more liberal scale, and includes suet pudding, cheese, pork and beef.

2 ozs. of oatmeal are allowed to make one pint of gruel. For the most part these are also the scales of diet adopted at foreign stations.

A breakfast may be given when necessary to a man on the day of his discharge from prison. On the day of his discharge a man receives no pay; he is not to be put on duty, or permitted to leave barracks.

These diets are issued to military prisoners wherever confined, viz., in military prisons, or in provost or garrison cells. The bread and meat are to be of the same quality as supplied to barracks, 9 ozs. or 8 ozs. uncooked meat with bone, or 8 ozs. or 7 ozs. without bone, to produce 5 or 4 ozs. of cooked meat. As a rule, and in accordance with the conditions of contract, articles of diet are issued to the provost sergeant by the contractor. For those on such short commons, as the above, both the quality and quantity of the prison supplies ought to be well up to the standard; a great injustice may be done and permanent injury to health occur if it is not so. In respect to this matter it is feared too much trust is frequently placed in the provost sergeant's honesty.

It is provided that, "in the case of prisoners sentenced to long terms of imprisonment, who may be temporarily confined in provost or other prisons, where neither the materials for the

higher class of diet nor the means of preparing them are at hand, such additions of bread and oatmeal gruel will be made to the diet as may in the opinion of the M.O. be necessary." All such recommendations should pass through the S.M.O. to the O.C. the station, the provost prison being a garrison institution.

*Scales of Diet for Ill-conducted and Idle Prisoners.* See A.O., September 1887.

Oatmeal by weight contains more nutritive material than wheat flour or bread, more fat, and less starch. This latter defect as a diet can be rectified by the addition of treacle or molasses. Owing to the almost complete absence of gluten, it cannot of itself be made into bread. Oatmeal is readily cooked by boiling, is easy of digestion, wholesome and nutritious; for these reasons it is employed in prisons as a stable commodity of diet, more especially so on account of its comparative cheapness. By the purchase of oatmeal more can be got of those elements necessary to sustain the body than by a similar expenditure of capital on other foods.

Here may be added some of the rules for the management of provost prisons, which should engage the attention of the visiting M.O.

Every prisoner is to wash himself thoroughly at least once a day, to shave daily, to change his linen twice a week. On admission the hair of every prisoner will be cut close, except when the sentence is for a period of less than 72 hours, in which case the hair will not be cut, unless an order to that effect, signed by the prisoner's C.O., is attached to the committal.

Every prisoner is to keep his own cell, together with the utensils and furniture thereof, clean and orderly.

The bedding when in use is to be removed during the day, and in dry weather exposed to the air.

Soldiers summarily committed to cells by C.O. for periods not exceeding 168 hours are to be provided with their great coats, together with a single blanket or rug. Prisoners under sentence of court-martial are to be provided in the same manner during the first week of their commitment, after which they are to have their bedding, viz., barrack palliasse and bolster, with three blankets. They are, however, to be deprived of the bedding every third night during the remainder of their imprisonment.

If a prisoner "falls out" for any purpose during shot exercise, he is to be required to make up the time by remaining ten minutes after the class is dismissed for every such occasion, unless it should be certified by the M.O. that the state of the prisoner's health rendered it unavoidable.

There is no regulation that I am aware of that defines the amount of work a prisoner on hard labour punishment in a provost prison is to undergo. Besides a few hours fatigue during the day, here at Sheerness they get three hours in three periods of one hour each, and punishment drills of one hour and

a half marching order without arms. This represents a considerable amount of physical labour, rather excessive when taken in relation to the food supply, especially so if a prisoner is on punishment diet.

Both in the interest of the soldier and the State a M.O. ought to see that men are not too frequently placed on punishment diet, as they lose flesh and strength while taking this food. It is against public policy that a soldier's health should in any way suffer on account of the enforcement of military law.

It has often been said, with much truth, of a soldier:—"That fellow is always either in jail or in hospital." The connection between these institutions, although otherwise sought to be established, is chiefly in the relation of cause and effect. It is after coming out of jail he goes into hospital, where he has to be fed up and rested until again fit to start on his career. However, soldiers of this class, fortunately not a numerous one, are expensive and worthless. Such men are pretty certain to be among the evacuated in war; they will always endeavour to fall back on the hospitals during active operations, and the C.O. will not be sorry to lose them.

Officers, warrant officers, women, and children when sick are as a rule treated in their quarters.

**Women and Children** when sick in barracks are treated in their quarters unless when suffering from scarlet fever, diphtheria, and small-pox. Other infectious maladies will, as a rule, be treated in quarters. The wives and families of soldiers borne on the "married roll" of the regiment when placed on the "sick list" may be allowed medical comforts or diet extras as follows:—Wine, brandy, arrowroot, essence of beef, or extractum carnis, but fresh meat will not be supplied for the preparation of beef tea, and milk or other extra beyond those specified will not be allowed. Previous to the issue of any articles the C.O. must certify on A.F. I 1205 that the individual is entitled by regulation to receive extras. An entry in the case book should be made of all such cases, showing the necessity for the issue. Where there is no female hospital, a room in barracks may, under certain circumstances, be set apart as a non-dieted hospital for the treatment of the wives or families of soldiers. The wives and children of soldiers who are married, but who are not on the married establishment, may receive medicine and medical attendance at the discretion of the P.M.O., but there is no authority for the allowance of extras.

**Confinements, Female Hospitals.**—Women are not entitled to claim medical attendance during their confinement, except when admitted into a female hospital. Arrangements should be made by them to procure the assistance of a midwife or civil practitioner. There are two kinds of female hospitals in the service with distinct establishments, one for cases of parturition, and the other for infectious diseases.

Although a M.O. is not bound by regulations to attend the wife of a soldier in her confinement in barracks—except when called in to assist a civil practitioner or midwife—should his duties permit him to do so, he takes a considerable responsibility on himself if he refuses to attend when called upon under any circumstances.

The wife or child of a soldier borne on the married roll of his regiment is “free” from stoppages while in hospital; if not on the strength, and admitted for the safety of the troops and the public, a woman is charged 1s., a child 6d.

Wives of N.C.Os. and men will invariably be admitted to hospital for their first confinement, provided there is sufficient accommodation; for subsequent confinements, when living in huts or occupying one room in barracks, an application for admission to hospital will be made to A.F. B 247.

**Sick in Barracks.**—A soldier when sick may be treated in his quarters, where there is no hospital accommodation provided.

A warrant officer when sick is privileged to be treated in his quarters under circumstances where hospital treatment is unnecessary, or his recovery would not be hastened thereby. If admitted to hospital, when practicable, separate accommodation should be afforded him.

**An Officer when Sick** is, as a rule, treated in his own quarters. When placed on the sick list, a report is at once to be sent, on A.F. A 27, to his C.O., who can then acquaint the staff officer of the circumstance, as he keeps a roster of garrison duties for field officers, captains of the day, &c. A similar report will be sent to the M.O. in charge of the station hospital in time for record in the morning state of sick, if possible, or the weekly return of the hospital, which closes at 12 o'clock noon on Fridays. Whenever an officer is put on or taken off the sick list a report must be made at once by the officer in charge of the case to the C.O.

Under ordinary circumstances an officer on the sick list may be recommended by his medical attendant, for the benefit of his health and in order to hasten recovery, to take exercise out of doors, but a M.O. has of himself no authority to grant this as part of the treatment.

An officer in close arrest is not allowed to leave his quarters or tent, except for the purpose of taking such exercise as the M.O. may consider necessary for the preservation of health.

Officers sick in quarters who may require hospital treatment can only be admitted on the recommendation of a medical board, and then only at stations where special accommodation has been provided, in which case they will be required to pay hospital stoppages at the rate of 2s. 6d. a day; but this does not apply to officers suffering from wounds received in action or from illness contracted on active service in the field.



**Officers' Sick Leave.**—“An officer requiring sick leave on account of wounds, or the state of his health, or when prevented from rejoining his corps on account of ill-health, should obtain a *medical certificate* on which to ground an application for sick leave. The certificate is made on A.F. B 175. The M.O. is to state candidly and explicitly his opinion as to the period which will probably elapse before the officer will be able to undertake his military duties.”

A medical certificate is required when one officer exchanges with another, to the effect “that the officer is in a fit state of health to serve at the station where the corps into which he applies to exchange is quartered.”

A certificate is required in the case of an officer retiring who holds a saleable commission, stating that he is in good health, or that his disability, if any, does not threaten early death.

**Medical Board.**—Definition: a board consisting of three M.Os., but in case of emergency two will be sufficient to constitute a board.

“The proceedings of medical boards on sick and wounded officers will be forwarded in original to the P.M.O., who will transmit them, together with a detailed statement of the officer's case from the M.O. under whom he has been treated, to the officer ordering the board, by whom they will be forwarded to the A.G. to the Forces, or head of the department in London, as the case may be.”

A medical board is necessary in case of an officer making application for instruction at the staff college. Formerly a certificate was required, but it was obviously an extremely onerous duty for one officer to pronounce another unfit for staff employment; again, too great an opening was left for the entry of men physically unfit for staff duties. At present there is no standard of vision for staff officers.

The proceedings of medical boards on officers are confidential. They are recorded on A.F. A 45.

Whenever a departmental officer is absent from his duty through sickness for less than 30 days at his station, he ought to forward a certificate from his medical attendant to the O.C. the station, otherwise the days absent will be included in his ordinary leave of absence, which will never exceed 61 days.

R.W. Pay and Promotion, 1887, states:—“When a departmental officer shall be sick at his station, whether in hospital, quarters, or lodgings, his absence from duty on account of sickness, if not exceeding 30 days in duration, and if duly certified by a M.O., shall not be included in the period of absence with pay allowed by Art. 429, provided the general or other O.C. at the station considers that the circumstances of the case warrant such a concession.” Any excess of such leave of absence on account of

sickness at an officer's station beyond the period of 30 days, shall come under the provisions of Art. 435, which states—"When the period of leave allowed (61 days) shall have been exhausted or expended in consequence of sickness, no further ordinary leave shall remain due." Sickness in quarters, Al. Reg. par. 352 states—"When an officer or warrant officer on the lodging list is absent from his duty, being sick in quarters, the issue of lodging money will be continued, but the number of days for which the allowance has been drawn during sickness in quarters will be clearly shown on the lodging money voucher. When the period exceeds 30 days, the issue will be subject to the approval of the G.O.C., whose authority will be attached to the voucher."

Officers according to their conditions of service are entitled to be provided with medical advice and attendance at the expense of the State; one of the objects for which the Medical Staff is maintained is to fulfil this condition.

All officers are servants of the State, and with its interests their first duty is concerned; this is a principle of wide application in the public services. Thus, in a measure, a military M.O. and patient may not have the same feeling of dependence solely for their individual advantage existing between them as does exist between a civilian and his patient, for here there is no third party concerned, no outside interests involved, but in the former case both are under obligations to the State, and herein is the guarantee that while the duty is efficiently performed, the interests of the public service are not compromised to any mutual understanding, good feeling, or friendship. Arrangements cropping up through such good motives are not recognised when pitted against the public weal. The military doctor not unfrequently finds himself in this predicament: the interests of his patient are at variance with those of the State; if he decides in favour of the latter, he is pretty certain to be unfavourably mentioned in that family circle—"the regiment." I think I am right in saying on this rather delicate question, involving both medical and military etiquette, that as a rule when officers with their corps employ civil practitioners to attend on them without any reference to the military M.O. detailed for that duty, such private arrangements should not be left to be carried on to the complete exclusion of the Medical Staff. The Medical Department under such circumstances cannot forego its obligations; its duty still will be to watch over the case, both in the interests of the public service and the public servant. Although an officer for some good reason of his own, or through caprice or whim, may prefer to be treated by a civilian, there is no reason why he should not be visited, and the case kept under observation and noted, by the duly appointed officer, otherwise an officer may be neglected when unable to help himself. Who would then be responsible? Or he may fall into the hands of unscrupulous persons working for their own ends, who

might exaggerate his illness, keep him for an unnecessary time on the sick list, and thus cause a loss of his services to the State, and unduly increase his expenses.

Civil practitioners, in the interests of professional etiquette, ought to be aware of the fact that every officer serving with a regiment or corps has an army doctor officially appointed, whose duty it is to render him medical advice and assistance.

**Infectious Diseases Occurring in Barracks.**—When officers, N.C.Os., or soldiers in any garrison or station, privately employ a civilian medical practitioner to attend upon them or their families for an infectious disease, they will at once report the circumstance, for the information of the O.C. and S.M.O. at the station.

**Disinfection and Cleansing Barrack-rooms.**—Special instructions are laid down for the cleansing of barracks in which certain specified diseases occur. The M.R. state how *scarlet fever*, *diphtheria*, *puerperal fever* are to be dealt with as a matter of sanitary precautions.

(a.) "The rooms will be vacated, and the windows kept open for as long a time as practicable, to ensure thorough ventilation."

(b.) "The furniture, floors, and all painted woodwork will be scrubbed."

(c.) "The bedding, clothes, carpets, etc., will be thoroughly cleansed and disinfected before further use."

(d.) "The ceilings will be whitewashed."

(e.) "The walls, if papered, will be re-papered, the old paper being first carefully scraped off. If not papered, they will be scraped and finished as before."

It is the duty of the M.O. attending the case to represent in writing to the O.C. the steps required to be taken under *a*, *b*, and *c*. For the engineer services a certificate is required from the principal or senior M.O. to cover the expenses incurred, which are charged as an incidental item of expenditure.

All processes of disinfection and fumigation will be carried out by the subordinates of the Medical Department whenever the necessary establishment exists; the materials will be obtained from the O.-in-C.-B., not from the surgery. A M.O. will supervise the use of chemicals whenever necessary to employ them.

The Medical Department do the fumigation and disinfection, the Barrack Department the cleaning and washing, the R.E. Dep. the re-papering and lime-washing. See p. 276.

**Air Purifiers** are used, either in the form of solids, fluids, or gases, to absorb substances from the air, or to pass into the air and then act on the gases or molecular impurities.

*Solid Air Purifiers* are dry earth, quick-lime, charcoal, calcium mixtures of lime and coal-tar, etc. Animal charcoal hung up in bags and kept dry absorbs gases rapidly, and oxidises almost every substance in the air capable of being so acted on.

*Liquid Air Purifiers.*—Permanganate of potash, chloride of zinc, etc. The foreign matters in the air to be purified are independent of disease particles, or particles of disease, carbon dioxide, hydrogen sulphide, ammonia, as ammonia sulphite.

*Gaseous Air Purifiers—Sulphurous Acid Gas.*—Fumigation by means of sulphurous acid gas is the one generally adopted in the service; it acts as an air purifier by deoxidising organic matter. It is evolved by burning 8 ozs. of sulphur in a metall vessel for each 1,000 cubic feet of space; this is the regulation allowance, but 1 lb. of sulphur to 1,000 cubic feet of space will give but one per cent. of sulphurous acid to the air, according to "Parkes," so the regulation allowance appears to be insufficient; it deoxidises by becoming sulphuric acid, which contains one more particle of oxygen.

When sulphur is burnt as a means of fumigation every precaution should be taken against fire; when used in tents, grass, etc., should be removed from around the vessel in which it is consumed. After fumigation, tents should be exposed to the air and well beaten.

*Chlorine Gas* is sometimes used, evolved from common salt by the action of oxide of manganese, sulphuric acid, and water; it decomposes hydrogen and ammonia sulphites, and acts on organic matter; it extracts hydrogen and indirectly oxidises.

*Nitrous Acid Gas* is also stated in the regulations to be used in fumigation; it is evolved from nitric acid by its action on copper shavings; it acts by direct oxidation; it is a powerful disinfectant, exercising a continuous action, and is said to be very efficacious in dealing with the poison of yellow fever. Chlorine gas exercises a marked influence over the poisons of exanthemata.

Chemical air purifiers act by—

1. Oxidation { Directly: Nitrous acid, ozone.  
Indirectly: Chlorine, bromine, iodine, etc.
2. Deoxidation: Sulphurous acid.
3. Restraint of putrefaction, limitation of growth, and by suspending vitality and propagation: carbolic acid.

One part of bichloride of mercury in 1,000 parts of water is perhaps the best way of disinfecting wood and furniture. See p. 278.

**Disinfection of Clothes.**—*Baking clothes* when the heat can be raised up to 230° without injury to the fabric, or *boiling* in one gallon of chloride of lime to 25 of water, or sulphate of zinc, one part to 120, or chloride of zinc, one to 245 parts, are the best ways of purifying such articles. Clothes may also be soaked in a solution of bichloride of mercury.

*Cholera.*—Special instructions as regards cholera epidemics are laid down for guidance in the M.R.

*Small-Pox.*—Several instructions are also laid down as regards the prevention of small-pox by vaccination. Every recruit is to be vaccinated after joining the service. A record



of *all* vaccination in the garrison, with the result of each operation, is kept in the vaccination register at the station hospital.

A M.O. doing duty with a regiment or detachment will make an inspection annually for vaccination marks of every man, woman, and child under his care. This inspection should be made in March, in order that a certificate be furnished by the 1st of April to the P.M.O. for the information of the D.G. relative to the state of vaccination.—*See* p. 147.

**Disinfection of Bedding.**—"The barrack bedding used by sufferers from *infectious fevers* or *itch* prior to admission into hospital, the straw will be burnt, and the bedding, together with the clothing belonging to the patients, but not actually in use, will, if not liable to injury thereby, be disinfected by heat or subjected to the process of boiling when practicable, or be immediately steeped in boiling water, without removal to hospital. The articles will then be handed over to the O.-in-C.-B. for the purpose of being exposed to the air and subsequently washed."

All articles should be disinfected before the kit of the man is taken into the hospital pack store; the clothing in the kit should be washed regimentally.

Barrack bedding, which has been in use of sufferers from itch or other infectious disorders prior to their admission into hospital, will not be received into barrack store unless accompanied by a certificate from the M.O. that it has been disinfected.

The O.-in-C.-B. will cause all such articles on their receipt to be exposed to the air and promptly washed, and the charge of cleaning must be borne by the regiment, unless it can be certified by the C.O. and M.O. that no neglect has occurred on the part of the soldier in reporting his disease.

When the charge for washing is admissible against the public, the regulations are complied with thus:—The M.O. sends a certificate to the man's C.O., (a) stating that certain articles enumerated, used by —, suffering from —, have been disinfected; (b) that the soldier was not guilty of neglect in reporting his disease. This certificate the C.O. attaches to A.F. F 704, which he signs. This is the same form as used when articles are exchanged as "having been in use the period prescribed by regulations."

**Periods of Infection.**—Uniformity of opinion with respect to the time which should lapse before persons who have infectious fevers are permitted to come among others is of great importance in the public service. The following is from the "British Medical Journal":—

"At the annual meeting of 1880 of the Forfarshire Medical Association, a committee was appointed to consider the conclusions of a paper read by Dr. Miller, of Dundee, to endeavour to fix safe limits for the periods of incubation and infection in the infectious fevers, with the view of ensuring, or at all events

promoting, the safety of the public, and at the same time terminating the conflicts of opinion frequently occurring in practice at the present time. As a result of these labours, at the recent annual meeting of this Association, at Montrose, Dr. Miller moved: 'That the Association, having considered the desirability of promoting uniformity of practice amongst its members in their management of the infectious fevers with respect to the period of time during which quarantine precautions should be maintained, recommends as follows: When an infectious fever has appeared in one or more members of a household, other members who may have been exposed to the chance of infection, by intercourse with them or otherwise, should not be removed to a household where there are others liable to be infected until the expiry of the period of incubation shows that they have escaped. Without going to extremes, the period of incubation may, for practical purposes, be considered to be: for small-pox, typhus, whooping-cough, measles, fourteen days each; and scarlet fever and diphtheria, ten days each. That convalescents from these fevers should be considered as still liable to give off infection until the expiry of time, counting from the beginning of the illness, ranging for each fever as stated below—

Disease.	Period of Infection.
Small-pox - -	14 days after termination of scabbing.
Typhus - - -	28 days from inception.
Scarlet fever - -	7 weeks „
Diphtheria - - 6	„ „
Whooping-cough - 8	„ „
Measles - - - 6	„ „

This information may also prove useful to a M.O. doing duty with troops on board ship, or on service with reference to the occupation of houses, or the evacuation of sick along the line of communication, etc. *See p. 352.*

**Billets.**—Some regulations connected therewith.

Accommodation to be provided.	Maximum Price.
Lodging and attendance for soldier where hot meal furnished.	Twopence halfpenny per night.
Hot meal as specified in Part I. of the Second Schedule to the A.A., 1881.	One shilling and one penny halfpenny each.
Where no hot meal furnished, lodging and attendance, and candles, vinegar, salt, and the use of fire, and the necessary utensils for dressing and eating his meat.	Fourpence per day.
Ten pounds of oats, twelve pounds of hay, and eight pounds of straw per day for each horse.	One shilling and ninepence per day.
Lodging and attendance for officer - - - -	Two shillings per night.

*Note.*—An officer shall pay for his food.

An allowance in lieu of rations is not admissible for the days on which a soldier is provided with a hot meal by an innkeeper, or on which he receives an allowance to provide himself with food.

The keeper of a victualling house on whom any officer, soldier, or horse is billeted—

1. Shall furnish the officer and soldier with lodging and attendance.

2. Shall, if required by the soldier, supply him with  $1\frac{1}{4}$  lbs. of meat previous to being dressed, 1 lb. of bread, 1 lb. of potatoes or other vegetables, 2 pints of small beer, and vinegar, salt and pepper, and

3. Where the soldier is not entitled to be furnished with a hot meal, shall furnish the soldier with candles, vinegar and salt, and allow him the use of fire and the necessary utensils for dressing and eating his meat, and

4. Stabling and forage to be supplied as above.

The police authorities for any place may cause annually a list to be made of all keepers of victualling houses liable to supply billets under the Act. For the purpose of billeting, a route purporting to be duly issued and signed, delivered to an officer or soldier and produced to a constable, shall be conclusive evidence to such constable of the authority to demand billets; thus it is said a route "proves itself." See p. 6.

The distribution of men and horses rests with the C.O. when it is practicable. Not less than two men shall be billeted in one house.

When a M.O. is temporarily attached to a mounted corps for duty on the line of march the C.O. is to provide him with a troop horse.

A billet is at all times to be drawn for him as in the case of regimental officers. N.B.—If his name is not included in the route, as it ought to be, his hotel expenses will not be allowed.

*M.Os. for Detachments* according to the Q.R.—Whenever detachments are composed of 200 men or upwards a M.O. is to accompany the party. On particular duties the attendance of a M.O. may be requisite with smaller detachments. Proceeding coastwise in contract steamer a M.O. accompanies parties of 50.

*Responsibility of C.Os. for Medical Attendance in Billets.*—Officers commanding detachments not having a M.O. attached are, immediately on arrival at their stations, to inquire whether there are any means of obtaining assistance from an army M.O. in the vicinity. It is only in cases where such aid cannot be obtained that they are to have recourse to civilian medical practitioners.

## CHAPTER X.

## HOSPITALS—THEIR CONSTRUCTION, ORGANIZATION, AND ADMINISTRATION.

**Hospitals.**—In the construction of hospitals the great points to be secured are—

1. Purity of the external atmosphere.
2. Abundance of pure air and sunlight within the building.
3. Facility of administration and of discipline.

The realisation of these principles involves the selection of a healthy site for the building, simplicity of plan and construction, a sufficient number of windows properly placed, a certain number and arrangement of wards, proper ward proportions, a suitable number of offices, stores, etc., and easy means of communication throughout the building.

It should never be forgotten that the object sought in the construction of a hospital is *the recovery of the largest number of sick men to health in the shortest possible time*, and that to this end everything else is only subsidiary.

*Selection of a Site.*—For military reasons station hospitals are usually built near the barracks in a town. To test the healthiness of a site an inquiry into the rate of sickness and mortality in the district will afford valuable indications as to the suitability of the site for sick; but care should be taken not to be guided by the mortality alone, for it by no means follows that a district with a low rate of mortality is suitable for sick.

The nature of the diseases and the facility or otherwise with which convalescence and recoveries take place must also be taken into account. Time is a most important element in the question, especially as regards sick soldiers, as their services are lost to the State while in hospital. The local climate should be healthy; there should be nothing to prevent the free circulation of air over the district, and the air should not be contaminated by passing over marshy lands, etc. In most cases the position selected for barracks will answer for the station hospital.

“The ground selected for a hospital should be porous and dry, not clay or retentive, or receive the drainage of any higher ground. Steep slopes should be avoided; it is very difficult to cut off water from higher grounds from the foundations of buildings. If the ground close by rises to a considerable height above the hospital it will stagnate the air just as a wall or rampart would do. In some localities it might be advantageous to



secure shelter from unhealthy winds, but the shelter thus obtained should be at such a distance as to ensure ventilation about the building, otherwise it would cause damp."

**Plan and Construction of a Hospital.**—It is an all-important point in construction to determine on what principle the building is to be erected, and on what basis the plan should be formed. "The first thing is to obtain good healthy wards, and having obtained them, everything else must be made to follow. The means of access, discipline, and administration must bend to the ward, but the ward must never be made to yield to them." Hence the ward unit is the foundation of an hospital plan, and the ward construction and its proportions must be based on the number of cubic feet to be allowed per head. Consequently the dimensions of a ward must vary with the climate from 1,200 to 1,500 cubic feet per head.

Without reference to the questions as to whether it is preferable that wards should be long, narrow, lofty, or wide, the Commission say:—"We would propose to make the breadth of the ward the foundation of ward construction, because a certain breadth of ward is essential for the ordinary working of the hospital; there must be a space along the centre for tables." Yet "the breadth of the ward should not exceed a certain number of feet, otherwise ventilation by opposite windows, which should always be resorted to when the weather and the season admit of it, cannot be efficiently maintained.

**Application of Principles of Construction.**—"Keeping these principles in view, if we take the opposite beds at 6 ft. 6 in. each in length (13 ft.), we may allow 11 ft. from foot to foot of the opposite beds, and the ward will be 24 ft. broad. One of the dimensions of the 1,200 cubic feet allowed to each bed will thus be  $\frac{2}{3} \times 12$  ft. If we allow 7 ft. 3 in. for each bed in the lengthway of the ward, we shall have  $12 \times 7$  ft. 3 in. = 87 square feet as the superficial area for each bed, and 14 ft. for the height of the ward.

The unit of cubic space per bed will thus be  $12 \times 7$  ft. 3 in.  $\times 14$  = 1,218 cubic feet. It would nevertheless be advantageous to add a foot or two in width to the ward, in order to give more space for tables, etc.

Each bed is three feet wide, so that these dimensions would give a distance of 4 ft. 3 in. from side to side of adjoining beds, if the beds were equally distributed along the wall.

The length of any ward can easily be obtained by assuming 24 ft. as the width, and 14 ft. as the height, and then, by multiplying half the number of beds required by 7 ft. 3 in., we obtain the length of the ward in feet. Thus, suppose a ward is required for 20 beds, then  $\frac{20}{2} \times 7$  ft. 3 in. = 72 ft. 6 in., the length required.

**Position of the Beds.**—The beds should always be arranged foot to foot on opposite sides of the ward, with their heads to the

walls. The number of beds to be placed in a ward should be divisible by four, in order to prevent loss of corner space.

The greatest economy of space would be effected by adopting wards for 4, 8, 12, 16, 20, 24, 28, or 32 beds, beyond which last number we would not recommend any increase.

One bed should be placed in each of the four corners. The other beds, half on one side, half on the other side, should be ranged two and two between the windows.

*Windows.*—The number of windows should be equal to half the number of beds.

A ward with 20 beds ought to have ten windows, five on each side.

The distance between the end wall of the ward and the first window from each corner should be 4 ft. 6 in. The wall space between every two windows should be 9 ft. wide, and the splay of the window into the room should be 5 ft. 6 in. wide."—*Commission on Barracks and Hospitals*, 1861.

**Specifications for Construction.**—The instructions for the R.E.Dep., 1888, state the size of hospital wards on construction in the United Kingdom to be as follows:—

*Ward.*—Normal size for 24 beds,  $87 \times 24 \times 14$ ; 14 ft. is the height of the ward. Ward for two beds, size  $20 \times 13 \times 14$ . Ward for one bed, size  $12 \times 13 \times 14$ .

1. *Walls of hospitals* to be constructed on the same plan as those for barracks.

2. *The bed space* for two beds between two windows must not be less than 9 ft.—3 ft. per bed and 3 ft. between them. The bed space between a window and an end wall should be 4 ft. 6 in. With the minimum distance between the windows, their maximum interval width should be 5 ft. 6 in., giving for each bed in the large wards a floor space of 7 ft. 3 in. by 12 ft., which, with a height of 14 ft., allows 1,218 cubic feet.

3. *The windows* of large wards should face east and west. The windows of all wards should be 2 ft. 6 in. from the floor to the top of the stone sill, about 10 ft. high, and should run up to within 12 in. of the ceiling; the inner sills to be bevelled to prevent accumulation of dust. In cold and exposed situations double windows may be used. Blinds should be provided to the windows of wards.

4. *Doors* to large wards to be 4 ft. wide, hung in two, and glazed with a swing fanlight above.

5. Care should be taken to vary the locks of hospital wards or stores in the same range of buildings.

Thus, briefly stated, are the specifications on which hospital wards will in future be constructed.

Wards should have direct communication with the outer air on two opposite sides by a double line of windows. This is a fundamental principle in ward construction, without the embodiment of which hospitals, so far as concerns recovery of the sick,

will never fulfil their object perfectly. Whenever a hospital is built, this cardinal principle must never be lost sight of. The only cases in which it can be dispensed with are in small wards with one or two beds for special cases requiring segregation, but even in such wards there should always be windows on two sides, if not on opposite sides, at least on adjacent sides. In all wards for four beds and upwards there should be opposite windows.

In all hospitals economy and efficiency of administration demands that each ward should be constructed so as to contain the largest number of beds consistent with sound sanitary principles. To fulfil these requirements, a most important element in hospital economy, the normal size of a ward has been fixed as one for 24 beds.

Wherever hospitals have to be established, in an enemy's country or elsewhere, it is necessary to bear in mind the foregoing considerations, which should form the basis upon which the arrangement and allotment of the buildings must be carried out in their conversion and appropriation as hospitals.

#### **Hospital Organization and Administrative Unit.—**

Military hospitals are classified, organized, and administered as—1. General hospitals; 2. Station hospitals; 3. Hospitals for soldiers' wives and children; 4. Hospitals in the field; 5. Hospital ships.

Although there are many different descriptions of hospitals in the service as regards organization, administration, and interior economy, the station hospital is typical of the principles and the entire system on which our army hospitals are established. A M.O. intimately acquainted with the working of a station hospital is so far competent to undertake the management of any military hospital.

The purpose for which station hospitals are established is laid down in the M.R. as follows:—

“Station hospitals will be for the reception and treatment of sick from all corps in garrison, including those of the Auxiliary Forces when embodied, and such other soldiers, seamen of the Royal Navy and Royal Marines, as the O.C. the station may direct to be admitted therein.”

And in the Q.R. we read:—

“Medical officers in charge of hospitals will, upon obtaining the authority of the O.C. a station for so doing, take under their care any non-commissioned officers or soldiers of corps not in garrison, or seamen and marines who, being absent from the ship or corps to which they belong, are under the necessity of applying for medical relief or assistance.”

The necessity for this paragraph is apparent when we consider the purposes for which station hospitals are established—“the reception and treatment of sick from all corps in garrison.” Consequently the M.O. in charge must obtain authority for the admission of those not on the strength of the garrison. Soldiers.

brought on the strength of the station are entitled to admission to hospital without further authority; it is in this way treatment is authorised, namely, by bringing a man on the strength of the station.

Military hospitals, their medical and nursing establishments, were formerly under the disciplinary control of officers commanding corps, or specially appointed to the command; but now, through change of system, all orders, arrangements, and details for carrying on the necessary duties in the establishment according to regulation are centred in the M.O. in charge, under the authority of the general or O.C. the station; while the duties of the purveyor's department, which provided for equipment, supply, pay, etc., are distributed between the supply and barrack services and the Medical Staff. The duties of a hospital establishment, formerly carried on by soldiers from regiments, are now performed by a fixed establishment of the M.S.C., under the command of the M.O. in charge, who is invested with the necessary authority for the control and management of the hospital.

Where no M.O. is specially appointed to a station hospital in addition to his other duties, *the charge devolves on the senior present*, but the regulations do not say that the officer appointed to the station hospital will, if senior at the station, be in charge of the troops in addition.

The duties of the M.O. in charge of a station hospital might be arranged under these heads: 1. Medical; 2. Military; 3. Administrative. The *first* are professional; the *second* relate to military command and the necessary authority for the issue of orders for the observance of discipline and interior economy; the *third* relate to departmental duties in connection with the administrative departments of the army.

To deal with the strictly professional duties of a M.O. does not come within the scope of this work; for the *second*, or military executive duties (see **Military Command**). From the M.O. in charge "will emanate all instructions, orders, arrangements, and details for carrying on all duties connected with the hospital."

With the *third* division, or such as relate more particularly to administrative duties, the following will deal, while adding some remarks on interior economy, etc. The M.O. in charge is the accounting officer for all stores and supplies in the hospital, that is to say, he is held financially responsible for them, but the Q.M. as the general store-keeper at the hospital, is responsible to him, and in addition for the keeping of accounts, records, and the preparation of all returns connected therewith, the position here being the same to the M.O. in charge as exists between the Q.M. of a regiment and his C.O.

To enable the M.O. to fulfil his obligations and the responsibilities connected with his charge, both the distribution of the sick and the hospital establishment are placed at his disposal.



“Station hospitals will be for the treatment of sick generally, and the M.O. in charge will at his own discretion appropriate wards for the treatment of infectious or contagious diseases, lunatics, sick prisoners, ophthalmic, or other special cases.”

Although the appropriation of the wards is left entirely at the discretion of the M.O. in charge, he ought to use great circumspection in the distribution of such sick as are prisoners, or men placed under observation on account of supposed mental derangements. It is well where special wards are appointed for this class of patient that they should occupy them, unless it be under very exceptional circumstances.

As the officer in charge is responsible that things within his jurisdiction are kept in safe custody and properly looked after, it is necessary for him to see that all the rooms and buildings within the hospital enclosure are only used for their allotted purposes, especially so as regards the store-rooms, and that there is no misappropriation of quarters.

In addition to being responsible for the care and treatment of the sick, he is “directly responsible for all the duties of the hospital; he will take care that the instruments, medicines, hospital equipments, clothing and stores held on inventory are in good condition, sufficient according to regulation, and kept in safe custody; that the supplies are of good quality, and that the cooking and distribution of the diets are properly carried out.”—*M.R.*

**Hospitals to be Visited by the General and the Chaplain.**—General and other officers commanding stations will frequently visit the hospitals under their command, to satisfy themselves that they are conducted conformably to the regulations. They will likewise be responsible that divine service is performed in hospitals and duly attended, when practicable, by the patients; and that the sick are regularly visited by the chaplain or officiating clergyman. Thus the M.O. in charge is not responsible for the chaplain’s visits, but he should notify to him whenever a patient is dangerously ill or desires to see him.

**Visit by Officer on Garrison Duty.**—Such officers as may be directed by G.O.C. are to visit the station hospital daily, but not during the morning and evening visiting hours of the M.Os., and they will report for the information of the general any irregularities they may observe.—*Q.R.*, sec. xiv., paras. 4-5.

The officer directed to perform this duty is the field officer, captain, or other officer on garrison duty for the day. A visitor’s book is kept at the hospital; this book is not intended as one in which remarks are to be entered, but merely to record the visit. Officers very seldom visit the hospital except on duty.

**Information concerning their Men, how given to Commanding Officers.**—The copy of the sick report returned by the N.C.O. who marched the sick to hospital informs the man’s

C.O. of the admission and the nature of the illness; it thus notifies to him the occurrence of such disability as delirium tremens, the result of intemperance, or such diseases as have arisen from immorality. Some C.Os. show much interest in these reports, chiefly as records with respect to N.C.Os., as they in a measure guide them in their selection of men for advancement.

As well as the company sick reports sent to regiments, the "Morning state of sick," A.F. A 27, is sent daily to the C.O. of the troops at the station. This report informs him as to the number of sick in each corps under his command; it also shows the names, etc., of officers on the sick list.

Whenever an officer is placed on or discharged from the sick list, a report should be sent to the brigade major by the M.O. in charge of the case.

In addition to the information contained in the daily reports, the facilities afforded to regimental officers to visit their men while in hospital are laid down in the Q.R. Thus, under arrangements with the M.O. in charge, suitable and fixed times will be appointed.

**Dangerous Illness of a Soldier.**—Whenever a soldier in hospital "becomes dangerously ill, or when there is apprehension of a fatal result," the C.O. of the patient should be informed, in order that the man's friends may be communicated with.

**Death of a Soldier.**—In case of a death occurring in a hospital, a portion of A.F. A 27 is to be used as a "death report"; this is sent at once to the C.O. of the corps to which the man belonged, another copy to the O.C. the station, and a third to the S.M.O. The period after which interment may take place is to be stated by the M.O. forwarding the report. In addition to this service report, a "medical certificate of the cause of death" must be filled in by the M.O. who attended the case, and sent to the C.O. of the corps to which the man belonged, to forward to the District Registrar of Births and Deaths, who will provide the necessary certificate for burial.

**Report to Next-of-Kin.**—Immediately on the death of a soldier the C.O. will cause a report of the circumstances of the case to be made on A.F. B 118 to the man's next-of-kin, as shown in his pocket ledger, which is invariably to be corrected on the 1st January of each year.

On the death of a soldier a Committee of Adjustment is appointed by the C.O. See p. 128.

**Burial.**—The expense necessarily incurred for the burial of a soldier is borne by the public. The normal cost of a soldier's funeral is 1*l.* 15*s.* The O.C. provides the coffin and arranges the funeral.

We shall now consider some points in connection with the arrangements under which the sick soldier is housed, clothed.

and fed, and some matters of interior economy concerning the duties of M.Os. and the hospital staff, derived from various army regulations, or at least consistent with them.

**Buildings and Equipment.**—The duty of handing over the requisite hospital accommodation will rest with the O.-in-C.-B. "The responsibility for the maintenance of the fabric of the buildings, for their repair, and for any structural alterations will rest with the C.R.E."

Previous to hospital buildings or barracks being handed over, an inventory of fixtures in duplicate is made by the R.E.Dep. on A.F. G. 1002, "Soldiers' quarters and outbuildings, inventory of."

**The General Inventory** of stores in possession of the M.O. in charge of the hospital in Army Book 126 B is prepared in duplicate by the O.-in-C.-B. These inventories are signed by the parties between whom the transfer of equipment takes place. One copy is retained by the M.O., the other by the O.-in-C.-B.; a third copy may be made by the person having actual custody of the stores, *i.e.*, the Q.M. or steward, and kept by him for easy reference. The M.O. might also get his copy attested by the signature of the Q.M. or steward who holds the equipment directly under him; although this will not relieve the M.O. from his responsibility to the War Office, still as a matter of business it tends to fix responsibility in another quarter.

**The Inventory Boards**, one for fixtures, A.F. G 1002, and the other for furniture, A.F. G 1004, which are directed to be hung up in each ward, room, etc., should on no account have the number of any article recorded on them altered except by the R.E. officer or O.-in-C.-B., as the case may be. At the time of making out the ward inventories, in order to prevent disputes, copies of these inventories should be made and kept for record by the O.-in-C.-B., "initialed and dated" by the officer who holds the equipment in charge from him.

The inventory and boards remain the property of the O.-in-C.-B. If one is lost or destroyed, the sum of 2½*d.* will be charged, and if defaced, one farthing will be charged as a damage against the troops.

Of the things recorded in these inventories, neither more nor less ought to be in a ward, room, or store; the total number of articles shown on these boards throughout the hospital buildings will correspond with those recorded on the general inventory of the hospital, so that any alteration in any one inventory will cause at the same time a fresh entry in the general inventory, sometimes called the *long roll of the hospital*.

The inventory of furniture and utensils includes all articles of equipment for ward use, not including medical or surgical appliances.

Articles of patients' personal equipment, consumable articles for cleaning purposes, or the bedding (which is entered in

A. Book 54) are not shown in the ward inventory. Formerly one pillow and two sheets were left with each bed in the wards, but now they are kept in store and issued as part of the patient's personal equipment. Blankets, surgical dressing trays, and graduated glass measures in the wards (but not those in the surgery) for measuring the correct quantities of wine or medicine for patients, are shown as ward equipment.

**Fixtures** include presses, cupboards, pigeon holes for offices, and shelves generally. The supply of fixings and maintenance of all descriptions of window blinds, curtain rods and brackets—but not curtains or their rings—and the washing of window blinds, will, when duly authorised, be undertaken by the R.E. Dep. An account of what are fixtures, and what articles come under the head of barrack equipment, as furniture, may be found detailed in para. 512, Regulations for Army Service Corps Duties.

**On Transfer of a Quartermaster**, a steward, or other person having charge of stores from one hospital to another, steps will immediately be taken to ensure the stores being counted and duly handed over to his successor. The officer in charge will be present at the transfer, or detail an officer to superintend the transfer.

**Transfer of Equipment.**—When an accounting officer is relieved of charge of stores, the transfer is witnessed by the officer from whom the stores are held on inventory. When a transfer takes place between M.Os. of a hospital, “the Q.M. (if attached) and the steward will invariably be present.” A transfer on taking over charge, if correctly done, is a thorough stock-taking.

Whenever a transfer takes place within a hospital between assistant wardmasters or others, the transfer should be witnessed by the steward or other person from whom the articles to be transferred are held. This, a matter of interior economy, should be conducted on the same principle as the more general transfers to which the regulations refer. Wardmasters, as well as being responsible for the ward equipment under their immediate charge, may have to account for other things; for instance, books obtained from the garrison library for use of the patients in their sub-divisions are under their charge. See **Library Books; Orderlies in Charge of Wards; Vouchers; Occupying a Post.**

**Camp Equipment.**—On service the equipment of hospitals is not held on inventory from the A.S.C. All such equipment in the field is issued by the Ordnance Store Department direct. In like manner camp equipment is issued at home.

In case an officer in charge of a station hospital finds it necessary to have a tent pitched in order to increase the accommodation, or on account of infectious disease, the requisition should be



made in duplicate on general equipment requisition, A.F. G 997. This form is directed to be used for demands for such "casual equipment." The approval of the P.M.O. should be obtained; in cases of emergency his signature may be subsequently obtained to the requisition.

Having stated the purpose for which station hospitals are established, and referred to the appropriation and equipment of buildings generally, we shall now sketch briefly the duties of the staff, abstracted from the details laid down at length and very distinctly in the M.R., Part II.

The chief object of our hospital organization is to administer to the wants of the sick or wounded soldier under whatever circumstances he may be placed, while, with due regard to the interests of the service, he must be restored to the ranks as speedily as possible.

No more important duty devolves on a M.O. in charge of a hospital than to regulate and direct the efficient nursing of the sick. Such hospital duties as are of a technical or professional nature might be considered apart from others, but they are too intimately connected with the general duties of the department to be thus specially distinguished with any practical result.

**Wardmaster.**—The highest and most responsible appointment in the M.S.C. is that of chief wardmaster, who is generally a sergeant-major and warrant officer. He is the subordinate head over the nursing establishment of a hospital. His is an important appointment, and one of great trust. His chief and special duty is in the immediate care and comfort of the sick. He is responsible for the distribution of medicines and nourishment, wine, spirits, and all extras to the patients, according to the M.O.'s instructions. Where there are nursing sisters this duty devolves on them. The "wardmaster will accompany the M.O. on his visits round the wards, and carefully note his instructions and orders." He is charged with the cleanliness of the wards and the personal cleanliness of the patients, and will see that the sheets and clothing are changed according to regulations, or as required (*see Washing*). He is to maintain good order and regularity in the wards, and discipline throughout the entire hospital—duties, bearing an analogy to the military executive duties of a regimental sergeant-major. *See Regimental Administration.*

The wardmaster may delegate to the assistant wardmaster such of his duties as the *M.O. in charge may direct*. *See Delegation of Duties*, p. 37.

When a soldier is admitted to hospital, he comes under the care and direction of the Medical Staff. His uniform is changed for hospital clothes. The former is placed in the pack-store, together with the rest of his kit, during the time that he remains in hospital.

**Money and Valuables belonging to Patients.**—Medals, money, watches, or other valuables in possession of a patient are thus disposed of:—

On the admission of a soldier to a hospital where there is no Q.M., the wardmaster is responsible for the custody of all such articles which a patient may have at the time of his admission, or which may at any time after be received by him during his stay in hospital. A receipt will be given in duplicate for these articles; one copy will be handed to the patient, and the other, marked duplicate, forwarded to his C.O. To give two original receipts for the same things should be avoided.

The steward or pack storekeeper, where one is appointed under him, in the event of their finding in the kit or clothing belonging to the sick any money or valuables, such articles will be handed over to the Q.M., or in his absence to the wardmaster, and note should be taken in the pack store check-book of the property thus transferred. The entry made of these articles will be shown in the duplicate list of the pack store check-book which is given to the wardmaster.

On the discharge of a man from hospital, the wardmaster will hand him over, with his kit, medals, money, or valuables, to the N.C.O. marching the men to barracks.

The wardmaster should keep in a book for the purpose a record of all monies or articles of value a patient has with him on admission. The entry in this book should correspond with the receipts given to the man and to his C.O. The entry in the wardmaster's book should be signed by the man to whom the articles belong on his discharge in acknowledgment of his having received them; but if he is leaving the hospital as an invalid, a receipt is given by the officer in charge of the party. There is no regulation directing that this book should be kept, but it is absolutely necessary in the way of business. *See p. 361.*

**Money.**—It is against regulations that patients in hospital should have money; it is not required by them, and may be used for bribing orderlies or obtaining liquor or unauthorised articles, etc. Writing materials, tobacco, etc., can be got on requisition sent through the M.O. from their companies. The best plan is to have all letters stamped and posted by the pay-sergeant of the man's company. It would be well if the M.O. made himself acquainted with the appearance of any articles of value, such as a watch and chain, in possession of patients at the time of their admission, as it might prevent correspondence, disputes, or dispel rumours of substitution in the case of the death of a patient. On transfers between wardmasters it is necessary to see that all such articles are duly accounted for. On board ship the pack storekeeper is also appointed assistant wardmaster, and here money, etc., in possession of the sick will be taken over by him and handed to

the military officer in "command of the troops and invalids." The replacing of medals on the tunics of men causes some expense, the master tailor charging one or two pence each for sewing them on; still, by general order No. 5, 1886, "medals should never be placed in store attached to men's tunics." See p. 36.

**Patients' Personal Equipment.**—It is the duty of the wardmaster to requisition the steward for the necessary articles of hospital clothing for men admitted. This he does in the check-book for patients' personal equipment, Army Book 42; all articles issued to patients are entered in this book. The correct number of these articles may be found in Part I., Regulations for Medical Services. On the discharge of a patient from hospital the same number of articles as were issued to the patient must be returned to the steward; for this the wardmaster is responsible. Patients will be held responsible for the equipment they receive according to their degree of capability of looking after it. The price of articles of clothing is regulated according to the Pimlico contracts, which are published annually in A.O., but the price vocabulary of barrack and hospital stores is only issued when fresh contracts are made.

The wardmaster's requisition, of which he retains a counterfoil in his book, is the only recognised authority for the steward to issue a patient's personal equipment out of store.

**The Pack Storekeeper** is responsible for the care and custody of soldiers' kits while patients in hospital; his duties are under the steward. On admission the man's kit is at once handed in to him. No dirty articles should be placed in store. The pack storekeeper should brush, air, and clean the clothing belonging to the kits, and preserve them from damp or injury by insects. An inventory of all articles received into store should be made in the pack store check-book, Army Book 182, and the condition of each noted by an initial letter, thus: "N." new, "G." good, "B." bad, "W." worn.

The wardmaster receives a copy of the inventory made in this book on the counterfoil; on each page is recorded the articles in one kit only; a number is to be printed on each kit in store, and this number is to correspond with a similar number in a page of the book. The shelves where the kits are packed are numbered, but this is not sufficient to prevent mistakes. When the kits are removed for the purpose of being aired, on being put back they may get into wrong places. On the ticket numbers on the kit may also be noted the days on which they were aired, etc.

As the pack storekeeper is responsible for the safe custody of all articles under his charge, the store ought not to be so placed as to be liable to be trespassed on by N.C.Os. or orderlies, either in the discharge of their duties or otherwise; when there is no Q.M. the pack storekeeper is directly responsible to the

steward, who is general storekeeper of the M.O. in charge. It is a good rule to get the pack storekeeper to compare his pack store check-book with the admissions in the admission and discharge book of the previous day, to see whether the numbers agree, and if any have omitted to hand in a kit, it should be reported at once to the senior wardmaster. It is the duty of the N.C.O. who marches the sick to hospital to bring the kits of the men and hand them over on admission to the wardmaster, in order that they may be placed in store; under no circumstances will the duties of pack storekeeper be delegated by the steward to a private. The steward should exercise a general supervision over this store, and it is a good plan to make him report once a week as to the regularity with which the storekeeping is conducted. **On Board Ship**, see p. 361.

**The Compounder** is responsible under the Q.M. or wardmaster, as the case may be, to the M.O. in charge for the care and custody of medicines, stores, medical appliances and instruments in the surgery. He is directly responsible for the dispensing of medicines. See p. 80.

**Cook.**—The duties and instructions for the guidance of the cook in connection with the preparation of food which he receives are stated at length in the M.R. Three duck trousers and three canvas aprons are sanctioned in the hospital equipment for each cook; so they ought all times to appear clean while meals are being served.

**Clerical Duties.**—The wardmaster prepares all returns of a professional nature connected with the sick. The admission and discharge book and all medical records are kept by him. In the absence of a Q.M. he will prepare and submit for signature of the M.O. in charge the monthly account of hospital stoppages, A.F. O 1643, and also will keep the personal charge book, A. Book, 51, and the regulation book for hospital clothes, A. Book, 42. Where there is no specially-appointed clerk, he "will perform all clerical duties required by the M.O." A great defect in the arrangement of the duties of the hospital staff in some hospitals is that far too much of the wardmaster's time is absorbed in clerical work and in duties outside the wards, where his time should chiefly be spent in attendance on the prescribing M.O. and directing the nursing of the sick. To obviate this defect, the best plan in a large hospital is to appoint a standing orderly wardmaster for a period to do all outside work connected with the duties of a wardmaster, such as the washing and clothing of the sick on admission, handing over of their kits to the pack storekeeper, the receiving over of the kits of men discharged, the filling-in of the headings on diet sheets, etc. By this arrangement the assistant wardmasters in divisions are deprived of any excuse for absenting themselves from attendance on the prescribing M.O. I have adopted this plan with great success; it is quite within the regulations.



**Patients Employed in Hospital.**—M.Os. are authorised to employ without pay, “on light hospital duties, such patients as they may consider able to aid the fixed hospital establishment.”—*Q.R.*

N.C.Os., when patients in hospital, ought not to be employed on these duties; they are not available for employment in any menial office, neither can they, while patients in hospital, forego the responsibilities connected with their rank. It will be the duty of a N.C.O. to report to the wardmaster or other person belonging to the hospital staff any breach of discipline or departure from regulations they may observe, or any irregularity likely to cause waste or destruction of property.

**Regimental Orderlies.**—When orderlies are furnished by regiments in garrison, “the men so employed will not be available for regimental parades or other duties.” Soldiers thus appointed to act as hospital orderlies are not to bring their arms with them. *See p. 159.*

Under circumstances where soldiers are not available for these duties, civilians may be employed at the following rates:—Pack storekeeper, assistant steward, compounder, at 3s.; cooks and other subordinates at 2s. a day.

In the administration of a hospital, care should be taken that the subordinates are not endeavouring to contract themselves out of their engagements, or in other words, to delegate their duties without authority.

Although the duties and responsibilities of each N.C.O. are herein sketched, it is seldom the staff of any station hospital is so complete as to admit of such a division of labour. Where these various duties devolve on one or two subordinates, as is not unfrequently the case in the smaller hospitals in the districts, it is unnecessary to carry out every detail; yet it is only by knowledge of detail and attention to regulations that any system can be efficiently conducted.

**Hospital Supplies.**—The day a soldier is admitted to hospital he is on barrack rations; if from prison, on prison diet. As a rule these rations should be sent to hospital uncooked. It is the duty of the company orderly corporal, who makes out the sick report for the regimental orderly sergeant, to see that the man's rations are brought to him. Soldiers “detained” in hospital for one day only are subsisted from their corps. Soldiers transferred from one hospital to another as patients or on board ship, are dieted at their destination; but should diets be drawn for them before their departure, they ought to bring a notice to this effect; or, if practicable, one should be sent on, so that their diets may not again be drawn. If any require nourishment in addition to their barrack rations before being placed on diet, they may get the following extras, viz. :—

Bread, butter, tea, sugar, eggs, extractum carnis, or essence of beef, arrowroot, milk, wines, and spirits.

On the departure of invalids who are not on diet a similar course may be adopted, but in all such cases the extras will be entered on the diet sheet.

**In Non-dieted Hospitals** the ordinary barrack ration will be drawn and supplied from the corps to which the man belongs. In these hospitals when necessary the following extras may be issued, viz.:—

Extractum carnis, or essence of beef, sugar, tea, oatmeal, arrowroot, barley, wine, brandy, mustard, pepper, salt, milk, and eggs.

When, owing to their being no hospital at the station, men are treated in quarters, the same may be given, with the exception of wines and spirits.

Women and children, including step-children, up to 14 years of age, treated out of hospital, may get the following medical comforts, viz.:—

Wine (port or sherry), brandy, arrowroot, essence of beef or extractum carnis. Fresh meat or milk is not allowed.

Reference will now be made to the classification and composition of hospital diets, and the mode of ordering, obtaining, and accounting for all authorised supplies according to regulations.

**Classification and Composition of Diets.**—In military hospitals there are seven classes or variations of diets, arranged so as to facilitate the prescribing of different quantities and descriptions of food. They are also arranged so as to simplify the keeping of the accounts by the steward, and the checking of expenditure by the O.-in-C.-S.

*Diets are composed as follows:—*

*Tea Diet* consists of 12 ozs. bread and  $\frac{1}{2}$  oz. tea.

*Milk Diets.*—12 ozs. bread, 3 pints milk, 2 ozs. rice, and 1 oz. sugar.

All other diets are meat diets; 16 ozs. of bread are given with each, except roast and varied, to which 2 ozs. are added in lieu of the barley and flour used in convalescent diet. In all diets, except “milk,” one pint of tea is given at breakfast and again at supper.

The regulation pint of tea consists of tea  $\frac{1}{6}$  oz., sugar  $\frac{3}{4}$  oz., and milk 3 ozs. A pint of tea or coffee may be ordered as an extra,  $\frac{1}{2}$  oz. of coffee to the pint, yet  $\frac{1}{2}$  oz. of coffee is stated as the equivalent substitute for  $\frac{1}{6}$  oz. of tea.

Under circumstances where a grocery ration is issued to soldiers, they get tea  $\frac{1}{6}$  oz. and coffee  $\frac{1}{3}$  oz. daily, but no milk.

*Beef-tea Diet.*—8 ozs. of fresh beef, or  $\frac{1}{2}$  oz. of extractum carnis, to make  $\frac{3}{4}$  of a pint.

The meat for hospital diets ought to be from four-year-old animals; meat is then at its best. Mutton for broth should, if possible, be of this age; at least 25 per cent. more two-year-old mutton will be required to make the same quantity of broth as what can be got from four-year-old meat. See **Condition of Meat Contract**, p. 239.

To make good broth meat is cut small and put into cold water, and then warmed to 150°. Beef gives the weakest broth, mutton a little stronger, and chicken the strongest of all.

*Chicken Diet.*—10 ozs. of fowl, equal to 8 ozs. without bone, to make  $\frac{3}{4}$  pint of chicken tea if so ordered, otherwise fowls are directed to be roasted, not boiled. A chicken is only sufficient for one diet, but a fowl divided after being roasted whole should make two. To make chicken tea, old fowls should not be used.

A fowl to produce 1 lb. of meat (or two diets) should not weigh less than 1 $\frac{1}{4}$  lbs., according to the M.R., Part II.; but by the condition of contract it may be seen that fowls for hospitals in England ought to weigh between 1 $\frac{1}{2}$  and 1 $\frac{3}{4}$  lbs. each.

*Allowance of Meat and Vegetables in Diets.*—Convalescent, 10 ozs. of mutton or beef with bone; varied, 15 ozs.; roast, chop or steak, 10 ozs. When issued without bone its quantity is  $\frac{1}{4}$  lb. less.

*Fish*, 8 ozs., with 2 ozs. butter, may be given with either milk, beef-tea, or convalescent diets.

*Potatoes.*—Chicken, convalescent, roast, 8 ozs. each; varied, 16 ozs.

*Vegetables.*—Convalescent, roast and varied, 4 ozs. each, except in tea and milk diets, 1 oz. butter,  $\frac{1}{2}$  oz. salt (recently reduced from  $\frac{3}{4}$  oz.),  $\frac{1}{4}$  oz. tea, 1 $\frac{1}{2}$  ozs. sugar, and 6 ozs. milk are given.

*Flour*,  $\frac{1}{4}$  oz., and barley, 1 $\frac{1}{4}$  ozs., are issued with convalescent diets to make soup. Sugar is also allowed for colouring purposes. The pepper is to be added in cooking, and the vegetables are directed to be boiled with the meat, and not in bulk by themselves, as is the case with roast and varied diets.

Two ounces of pepper may be used for every 100 diets, except tea and milk diets. One ounce of mustard may be issued for every 20 beef diets. One-fourth of an ounce of sugar may be charged for each soup diet, in addition to the allowance in the scale.

**Substitutes.**—The following rates will be allowed for substitutes:—

2 ozs. lime juice = 1 lemon.

2 ozs. rice, or

3 ozs. flour or

8 ozs. bread

} = 16 ozs. potatoes.

1 oz. preserved potatoes = 5 ozs. fresh potatoes.

1 oz. preserved vegetables = 10 ozs. fresh vegetables.

$\frac{1}{2}$  oz. coffee =  $\frac{1}{6}$  oz. tea.

On active service, in general, base, and stationary field hospitals, the scale of diets laid down will be followed as far as practicable, and any deviations found necessary, on account of the position, climate, and the supplies obtainable, will be sanctioned by the G.O.C., on the advice of the P.M.O.

In India three bottles of beer are the stated equivalent of one bottle of wine—not the dietetic but financial equivalent; finance

regulates the equivalents of all substitutes. At home one pint of porter is the equivalent of  $\frac{1}{2}$  a gill, or  $\frac{1}{8}$  pint, or  $2\frac{1}{2}$  ozs. of spirits. Wine, spirits, and milk are to be calculated at 20 ozs. to the imperial pint; the reputed quart bottles contain  $5\frac{1}{2}$  gills, or  $26\frac{2}{3}$  ozs. *Wines* are defined to include sherry, port, tarra-gona, and claret; *malt liquor*, porter and ale; *spirits*, brandy, whisky, and gin.

**Diet Extras.**—The following “extras” are authorised, and may be given on all diets except “entire” and “varied,” but only when considered necessary for the treatment of the case, viz.: eggs, milk, tea, sugar, beef-tea, egg-flip, arrowroot, sago, oatmeal, rice-pudding, sago-pudding, custard-pudding, and the customary fruits in season. With 2 ozs. of arrowroot or sago 1 oz. of sugar is allowed, and for egg-flip two eggs, with  $\frac{1}{2}$  oz. sugar. *Wines, spirits, and malt liquors.*

**Diet Drinks,** such as barley-water, lemonade, etc., are authorised on all diets. The allowance for every five pints of barley-water is 2 ozs. barley and 2 ozs. sugar, and the same proportion for rice-water; if  $\frac{1}{2}$  oz. or 1 oz. were allowed to the pint it could be more conveniently distributed; the allowance of barley is so small that the cook has to boil it too long to make really good barley-water. As these drinks do not keep well, they ought to be made for the patients twice a day, and potash may be added, if necessary, as a drink for cases of gonorrhœa.

The following are useful formulæ for drinks, which can easily be made from the usual authorised allowances if prescribed by a medical officer:—

**Barley-water.**—Take 2 ozs. of pearl barley and wash well with cold water, rejecting the washings; afterwards boil with a pint and a half of water for twenty minutes in a covered vessel, and strain. The product may be sweetened and flavoured with lemon-peel, or lemon-peel may be introduced whilst boiling is carried on. Lemon juice is also sometimes added to flavour—a bland, demulcent, and mildly nutritive beverage.

For *Lemonade* two large lemons and  $1\frac{1}{2}$  ozs. of sugar are allowed for two pints.

**Cream of Tartar Whey.**—Stew a quarter of an ounce of cream of tartar (a large teaspoonful piled up) in a pint of boiling milk, and strain—a refrigerant and diuretic drink, which is rendered more agreeable by the addition of sugar.

**Alum Whey.**—Add a quarter of an ounce of powdered alum to a pint of boiling milk, and strain—an astringent drink, may be flavoured with sugar and nutmeg if desired. This will be found an excellent drink in enteric fever and some forms of dysentery.

**Cream of Tartar Drink (Imperial).** Dissolve a drachm or a drachm and a half of cream of tartar in a pint of boiling water and flavour with lemon-peel and sugar. When cold it may be taken *ad libitum* as a refrigerant drink and diuretic.



**Contract for Hospital Supplies.**—Special conditions as to quality, &c., of hospital and prison supplies—contracts.

**Vegetables.**—The potatoes to be properly washed, and of the best quality the market at the time affords.

The vegetables to be of the best quality, and fit for dressing (the stumps and outer leaves being stripped off), and to be in the following proportions, or of such other descriptions and proportions as may be demanded, viz.:—one-eighth leeks or onions, three-eighths turnips, three-eighths carrots, one-eighth parsley or pot-herbs; one-eighth greens when parsley or leeks are not required, two-eighths greens when neither parsley nor leeks are required.

**Milk, Fowls, Eggs, and Butter.**—The *milk* shall be good, raw milk, neat, as it comes from the cow. The *fowls* to be young and of the best quality, weighing, when trussed and ready for cooking, not less than  $1\frac{1}{2}$  lbs. and not more than  $1\frac{3}{4}$  lbs. each.

The *eggs* to be fresh, and of an average weight of 2 ozs. each.

The *butter* to be thoroughly good and wholesome, and slightly salted.

*Fish.*—The particular kinds of white fish in season to be supplied, and all kinds to be fresh and firm.

*Port wine, brandy* (formerly stated as “Best Cognac,” now “Two Stars,”), *whisky*, and *gin* are to be supplied to hospitals in bottles  $6\frac{1}{3}$  gills each; *ale* and *porter* in imperial pints.

The *rice* is to be good, clean “Patna”; *barley* and *oatmeal*, the best quality; *tea*, black, good strong “Congou”; *sugar*, crushed lump (white lump). It may be observed sometimes when sugar is issued from the surplus Government stock that it is not crushed lump. It is added—“Before any article is accepted it will be inspected on the day of delivery by the (medical) officer appointed, and if considered by him to be inferior to the quality contracted for, or to the approved samples, such article shall be rejected, and the contractor shall remove the same.”

There is a great inducement for a contractor to supply perishable articles, or those for daily consumption, of an inferior quality; if they pass, his profit is secured—they cannot be brought up in evidence against him; if they do not pass, there still remains a chance of their being accepted if he again tenders them for issue. Hospital contracts are frequently sub-let; the greater number of hands they pass through, so much the more is there a likelihood of inferior articles being tendered or deception practised.

The penalty for bribing or treating under this or any of the supply contracts is stated in the conditions under which agreements are entered into (see sec. 23, A.A., in this book.) It is a matter of importance that a M.O. should have a knowledge of what his patients are entitled to receive, as well as to see what they are getting. See **Meat**, p. 239; **Bread**, p. 245.

**Milk.**—A cow will give about 20 or 25 pints; a goat, 6 or 8 pints daily.

The specific gravity of cow's milk is 10·30, of goat's milk, 10·33. The solids in cow's milk are about 12 per cent., in goat's milk, 14 per cent. Buffalo milk is richest in all ingredients—caseine, fat, lactine and salts. Cream should be from 6 to 11 per cent.; cream, like water, lowers the specific gravity. The standard of cow's milk usually adopted is—water, 87·5 per cent.; solids, 12·5 = 9·3 solids, not fat, and 3·2 fat.

“Milk varies in quantity and composition according to—1st, the age of cow; 2nd, the number of pregnancies, less milk being given with the first calf (*Hassall*); 3rd, to the age of the calf, being at first largely mixed with colostrum; 4th, to the kind of feeding, beet and carrot augmenting the sugar; 5th, and remarkably, according to the race, some cows giving more fat (as Alderneys), others more caseine (as the long-horns). The last portion of the milk given in milking is richest in cream.

“To give 23 ozs. of water-free food (or one day's allowance for an adult), rather more than 11 pints of milk, of specific gravity 10·30, are necessary. For an adult this would be far too much water, and the fat would be in great excess. But for the rapid formation and elimination of the young, the water and fat are essential. It is a question whether, in old age, large quantities of milk might not be a remedy for failures in tissue formation and elimination.

“This was a point debated by Galen, so old is this suggestion. It is still undecided. Some old persons cannot digest milk.”—*Parkes*.

Milk is acid, neutral, or slightly alkaline; the colour may vary, and be either of a blue, red, or green tint, due to the food upon which the animals are fed, or possibly to the development of organisms.

Milk, having its specific gravity reduced by the addition of water, or raised by skimming off the cream, may have water, salt, sugar, brains, chalk, &c., added to adjust the specific gravity.

“If we have a milk with a specific gravity of 1,030, we may, by skimming, raise its specific gravity to 1,032, and then by diluting it with water, reduce it again; *i.e.*, the entire milk is rendered heavier by the removal of the cream, and that which has been twice impoverished has the same specific gravity as it had when pure.

“It will be thus easy to imagine the erroneous conclusions to which one may be led by trusting to the evidence of the lactometer alone. As part of a complete examination of milk, and taken together with other evidences, the chemist derives much information from the specific gravity, but in the hands of the ordinary dealer and consumer the lactometer can scarcely fail to mislead.

“A low specific gravity is an indication of an absolute or relative excess of the fat, or of an absolute deficiency of all solids, and a high one of an absolute or a relative excess of solids not fat; thus the low reading on the lactometer may mean that the milk has been watered or is rich in cream, and a high reading that it has naturally but little fat, though much curd and sugar, or that it has been skimmed.

“Much difficulty in obtaining convictions would be saved by a legal definition of milk as the ‘mammary secretion of the cow,’ containing at least 8·5 per cent. of solids not fat, and 3 per cent. of fat; anything under 9 per cent. of solids not fat, and 4 per cent. of fat, being deemed to be of an inferior quality; and any falling below the minimum should be held not to be ‘of the nature, quality, or substance’ of the article purported to be sold.

“No real hardship would be inflicted even if this rule were rigidly enforced.”—*Willoughby*, “Practical Hygiene.”

To discover the numerous adulterations to which milk is subjected, it should be examined physically, microscopically, and chemically. I remember once, abroad, finding some small fish in milk, which a man was prepared to swear was not watered.

When milk is received at the hospital it should be physically inspected, and the specific gravity taken with the lactometer provided for the purpose; it should then be boiled and returned to the steward's store, to remain there until the hour of issue. Milk should not be left in the kitchen nor in the wards for any time. The vessel used for boiling the milk should be used for no other purpose. Milk is very liable to absorb poisons and convey disease. *See* sec. 18 A.A., p. 34.

**Butter.**—Water and salt are legitimate constituents of butter, but when it is so made up as to have from 10 to 20 per cent. of water incorporated with it, and an excessive proportion of salt added, these are fraudulent additions, punishable under the Food and Drugs Act. In these cases the salt is required to preserve the butter against the decomposition that such an amount of water would accelerate. Salt should not exceed 30 grs. to the ounce.

**Butterine** is manufactured as an imitation of or a substitute for butter; it is oleomargarine prepared by clarification from fat. To convert it into butterine it is churned with milk, coloured with annatto, and set by means of ice. It is not so digestible as butter, for which it is dishonestly sold or mixed with as an adulteration.

If two samples, one of genuine and one of fictitious or adulterated butter, be melted and dropped on a plate of glass, the latter, on cooling, will develop numerous minute crystals, the former none. These are crystals of stearine, which is not completely removed during the preparation of butterine; it

can also be tested by its being more easily melted and of a lower specific gravity. A sample of butter of a specific gravity taken with a float or bead below 910 is probably thus adulterated. The percentage of water in butter is ascertained by a process of evaporation.

**Fish.**—Pavy remarks—Among the fish having white flesh are the whiting, haddock, cod, sole, turbot, brill, plaice, flounder, etc.; the flesh contains but little fat.

The salmon, mackerel, eel, herring, sprat, are fish characterised by the presence of fatty matter in the flesh. Thus it is that these fish are richer and less suited to a delicate stomach than white fish.

Of all fish the whiting may be regarded as the most delicate, tender, easy of digestion, and least likely to disagree with a weak stomach. It is sometimes styled the chicken of the fish tribe. The haddock and sole are also tender, digestible, and suitable food for an invalid; cod fish varies much in quality and digestibility. He does not mention the golden mullet as the so-called woodcock of the deep.

The common ray and most of the order of cartilaginous fish, contrary to the rule applicable to fish, should not be dressed fresh; they improve by keeping. The turbot also improves by keeping a little, but salmon and trout should be cooked immediately on being caught. At Appendix 3 M.R. may be found instructions for the preparation of fish diets. The best way of preparing fish for diet is by steaming it. *See* p. 292.

**How Supplies are Obtained.**—In all hospitals the system of drawing perishable articles of diet or medical comforts will be by daily requisition on the Supply Department, their agents, or contractors.

Articles not perishable will be drawn in quantities calculated to last a week or longer according to circumstances.

**Requisitions.**—The requisition for supplies will also be a receipt; the steward will sign them on the back, or the requisitions will not be accepted as vouchers by the O.-in-C.-S.

All supplies must be requisitioned for in the four books which are issued for this purpose.

No. 1.	Army Book,	188	- Bread, meat and vegetables.
„ 2.	„	189	- Groceries and soap for patients' personal use.
„ 3.	„	190	- Wines, spirits, etc.
„ 4.	„	49	- In this book are recorded the articles for cleaning purposes.

There is also a simple form of requisition book, A.B. 30, in general use in hospitals; this book is for the purpose of asking for anything not mentioned in the foregoing books, such as coal, oil, wood, ice, straw for bedding, etc.; in such cases it may



become a voucher for the receipt of these articles. It is also used for application for fatigue parties, and for writing materials, etc., for patients in hospital.

The following are copies of the hospital requisition books, No. 1 to 4:—

**HOSPITAL REQUISITION BOOK, No. 1.—A.B. 188.**

\_\_\_\_\_ Hospital, at \_\_\_\_\_  
 Date of Requisition \_\_\_\_\_  
 Contractor's Name \_\_\_\_\_  
 is requested to supply the undermentioned before \_\_\_\_\_

		(Quantities in Words.)			(Quantities in Words.)
Bread - - -	lbs.		Potatoes - -	lbs.	
Flour - - -	"		Vegetables -	"	
Mutton - - -	"				
Mutton Chops -	"		Fruit, Lemons -	No.	
Beef for Boiling	"		„ Oranges -	"	
„ for Roasting	"				
„ for Beef Tea }	"		Milk - - -	pts.	
without bone }	"		Fowls - - -	No.	
Beef Steaks }	"		Egg - - -	"	
without bone }	"		Butter - - -	lbs.	
Fish* - - -	"				

\* Description to be specified.

Countersigned \_\_\_\_\_ Signature }  
 in full. } \_\_\_\_\_  
 \_\_\_\_\_ Medical Officer in charge.

The counter-signature is required where no Quartermaster is attached to the Hospital.

**HOSPITAL REQUISITION BOOK, No. 2.—A.B. 189.**

\_\_\_\_\_ Hospital, Station \_\_\_\_\_  
 Date of Requisition \_\_\_\_\_  
 Contractor's Name \_\_\_\_\_  
 is requested to supply the undermentioned before \_\_\_\_\_

		(Quantities in Words.)			(Quantities in Words.)
Oatmeal - - -	lbs.		Salt - - -	lbs.	
Rice - - -	"		Pepper - - -	"	
Barley - - -	"		Mustard - - -	"	
Sago - - -	"		Spice - - -	oz.	
Arrowroot - - -	"		Essence of Beef	1 lb. tins	
Tea - - -	"		Extract Carnis -		
Coffee - - -	"				
Sugar - - -	"				
			Soap, hard, fine	lbs.	

Signature and counter-signature in full \_\_\_\_\_

**HOSPITAL REQUISITION BOOK, No. 3.—A.B. 190.**

Hospital, Station \_\_\_\_\_

Date of Requisition \_\_\_\_\_

Contractor's Name \_\_\_\_\_

is requested to supply the undermentioned before \_\_\_\_\_

		(Quantities in Words.)			(Quantities in Words.)
WINES.	Port— Draught - Pints 6 to Gall. - Bottles		ALES.	Draught - Pints 6 to Gallon Bottles 8 to Gallon " " " " " "	
	Sherry— 6 to Gall. - "			12 to Gallon " " " " " "	
	Claret— to Gall - "		PORTER.	Draught - Pints 6 to Gallon Bottles 8 to Gallon " " " " " "	
SPIRITS.	Brandy - } Whiskey - } 6 to Gall. " "			12 to Gallon " " " " " "	
	Gin - - } " "			Soda Water - " "	
				Lemonade - " "	

Signature and counter-signature in full \_\_\_\_\_

On the counterfoils of these three forms must invariably be written the signature in full of the person who signed the requisition; on the back is printed the following:—"Received the supplies demanded on the other side. Date. Steward's signature in full." These receipted requisitions should be forwarded to the O.-in-C.-S. with the contractor's monthly account. The totals in the requisitions and account should agree.

**HOSPITAL REQUISITION BOOK, No. 4.—A.B. 49.**

Hospital, at \_\_\_\_\_

Date \_\_\_\_\_ 18\_\_.

For period from \_\_\_\_\_ to \_\_\_\_\_ 18\_\_.

**REQUISITION FOR CLEANING ARTICLES.**—For Wards, Passages, Kitchens, Stores, Out-buildings, etc., Utensils, Washing Bandages, and for *all* Hospital purposes except Patients' personal use.

Articles.	Quantity, in words.	Articles.	Quantity, in words.	Number of Beds fully equipped, in words, _____
Soap, Windsor	Cakes.	Chloride of Lime	lbs.	Received the Ar- ticles herein spe- cified.
" Hard -	lbs.	Bath Bricks -	No.	
" Soft -	"	Hearth Stones -	"	Non - Commissioned Officer, Army Hos- pital Corps.
Soda - -	"	Blacking - -	Tins.	
Sand - -	Bushels.	Matches - -	Boxes.	Date _____ 18__
Whitening -	lbs.	Clean- { Woollen	{ Are now is- sued as hos- pital equip- ment.	
Blacklead -	"	Cloths. { Cotton -		

I certify that the Number of Beds stated in this return are fully equipped.

Medical Officer in charge.

In the Allowance Regulations may be found the scale on which these articles are drawn in dieted hospitals for every hospital purpose, except patients' personal use—cleaning wards, passages, kitchens, stores, out-buildings, cooking utensils, washing bandages, poultice cloths, etc.—for one calendar month, in quantities according to the number of beds for which the hospital is equipped. Cleaning cloths are to be of uniform size, and each one-sixth of the unserviceable blankets and sheets which are used for this purpose. A special scale is laid down for non-dieted hospitals, and for Netley, Woolwich, and the Cambridge Hospital, Aldershot.

At the end of each month the requisition on A.B. 49 complete as a voucher is pasted on the space for this purpose at the back of the monthly diet account, A.F. F 735, which is rendered to the O.-in-C.-S. not later than the third day after the month for which it is prepared.

*Soap* for patients' personal use, which is drawn at the rate of 1 lb. for every 100 diets, is shown in a separate column in the monthly diet account.

The Q.M. attached to a hospital signs all requisitions for supplies. In his absence the M.O. in charge countersigns the requisition and its counterfoil after they have been signed by the steward. Where there is a Q.M. attached to the hospital he will be responsible for the receipt, custody, and issue of all diets and extras in the steward's store, and will see that no unnecessary quantity of supplies is allowed to accumulate.

When supplies of any kind are delivered the steward will sign the back of the requisition in acknowledgment of their receipt. Requisitions when complied with and receipted are returned to the contractor and retained by him until he submits his bill for adjustment to the O.-in-C.-S., who will see that the receipts and bill agree before authorising the station paymaster to settle the account.

In this matter the responsibility of the O.-in-C.-S. is direct, as it is he who authorises the payment.

**How Diets are Ordered in Hospital, and the Expenditure of Hospital Supplies accounted for.**

**Diet Sheet.**—When men are admitted into hospital the heading of the "diet sheets," A.F. I 1202, will be filled in immediately from the sick reports by the wardmaster. It is a good rule to put every man admitted on milk diet for the first day.

The diets are entered on the diet sheet by the prescribing M.O. one day in advance, to enable the steward to acquaint the O.-in-C.-S. of the quantities of each article of food he requires, such as meat, milk, bread, etc., which are not kept in the hospital store; but all extras are entered in the sheets and given to the patient on the day he is visited by the M.O., who enters

the extras and initials the sheet, which is all that is required after signing for the first time he makes an entry.

The lines between each article entered ought to be obliterated at the time of entry by drawing the pen through them, in order to avoid unauthorised entries being subsequently made. The quantity ordered should be stated in words.

**Ward Book.**—The hours at which stimulants are to be given and their mode of administration should be entered in the prescription book, Army Book 39, which is also the ward book or diary; herein all matters of importance relative to the nursing and treatment of the sick should be distinctly entered in the M.O.'s. own handwriting.

M.Os. should be careful not to order pledged abstainers to take intoxicating liquors, unless it is absolutely necessary as medical treatment for the cure of disease or to hasten recovery.

The entries in the ward book are best made at the bedside of the patient. The number of the ward, as well as the number, name, and corps of the man prescribed for, should be entered. An inspection of the ward books by the P.M.O. would give him the best indication of how individual M.Os. carry on these duties.

**Case Book.**—Whenever diet extras are ordered other than diet drinks, a note of the case, showing the necessity for the issue and the daily amount prescribed, should be made in the case book as a record; the number of the case book and the page where the entry is made are shown at the top of the diet sheet. All cases of importance, scientific interest, etc., are recorded in the medical case book.

**Economy in Ordering Extras.**—"M.Os. must bear in mind that although no specific instructions can be laid down in regulations as to the character of cases needing extras, all necessary economy compatible with the well-being of the patient should be practised, in order that an undue or injudicious issue of extras may be avoided.

"The P.M.O. will supervise the nature and quantities of diets and extras as ordered for individual cases. It will be his duty to call for explanation of any seeming excessive or inappropriate issue, to check irregularities or any apparent waste or extravagance, and to report the same, with his opinion thereon, to the D.G. for such action as may be necessary."—*M.R.*

**Diet Returns.**—Immediately after the diets and extras are entered on the diet sheets by the M.O., the wardmaster transmits them to the Q.M. or steward, who fills in the provision ticket, A.F. I 1218, from them, and also pages 2 and 3 of the monthly diet account, A.F. F 735. On these pages are shown a *Daily Abstract* of the diets and extras taken from the diet sheets.

This abstract shows the expenditure of every item of provisions in the hospital. When completed for the day the diet sheets, together with the provision ticket and the War Office copy of



the monthly diet account, will be returned to the wardmaster. The wardmaster, after checking the account, will pass the diet sheets to the wards, and the provision ticket to the cook, who on the receipt of this will attend at the steward's store to receive the supplies for the day, which should be issued as early as possible. In this provision ticket are entered the number and names of the diets and drinks for the patients by wards.

**Issues—how Made.**—The steward's issue is made in bulk, weighed, and measured out to the cook, of all diets and such extras as require cooking when prepared by him; it is he who portions out the diets, which are served up to the patients under the superintendence of the steward.

To assist the steward in calculating the quantities comprising the different diets, he is supplied with a "Ready Reckoner" A.B. No. 9, a very useful book. A scale of diets is hung up in each ward, so that patients may see to what they are entitled. It is also directed that some of the patients should attend at the time the cook receives the daily issue of diets, to see the food previous to its preparation. Moreover the M.O. on duty inspects the supplies and supervises their preparation and distribution. The wardmaster receives from the steward any wines, spirits, or malt liquor ordered for the patients; he is responsible for the distribution of these extras. The steward will be present in the kitchen at the issuing of the meals, and will see that they are properly prepared, and punctually and correctly issued to the various wards at the prescribed time.

The order for patients to inspect their food before it is prepared is of no practical utility. It does not seem to be in conformity with the customs of the service that they should do so, and looks like a want of trust in the hospital staff.

The cook receives everything from the steward—nothing direct from the O.-in-C.-S. or the contractor.

The practice in some hospitals of issuing articles for breakfast to the cook over night *for convenience* is not a good one; it may tend to make the tea weak.

A collusion between the "cook and steward, especially if the latter is also acting as wardmaster, is difficult to detect, and almost impossible to prove. Sergeants who are senior N.C.Os. in the station hospitals away from district head-quarters, are exposed to the demoralising influence of the small tradesmen who are sub-contractors or the local agents of the contractor. To the interests of the service it would be beneficial if these N.C.Os. held their appointments for, say, a limited term of two years.

**Completion of Accounts.**—The wardmaster, on the day following that on which the diets and extras are ordered, will lay the monthly diet account before the M.O. in charge for his signature.

At the end of the month the diet account in which this abstract is entered is completed by the Q.M. or steward, and forwarded by the M.O. in charge of the hospital to the O.-in-C.-S at the station. In this account is also shown a statement of provisions received, issued, and remaining. The total issues in this form must agree with the total abstracts from the diet sheets.

A second copy of the Monthly Diet Account is prepared by the Q.M. or steward, showing the daily details of each item received and expended, which after being certified as correct is retained as a hospital record; it is the steward's Provision Store Account, and a record of great importance, as through these detailed daily accounts can be corrected any omission or mistake which may have occurred in the more general account sent to the War Office. It is directed that this account should be produced at the inspections of the P.M.O.

The reason this account is directed to be prepared by the last day of each month is in order to enable the remainings in store to be checked by the Q.M., the M.O. in charge, or the O.-in-C.-S., on the first of the month following.

In the absence of a Q.M. the steward signs this account.

All diet and extra sheets must be sent at the end of each month to the principal M.O., and in no instance will copies of these be substituted on account of the originals being dirty or defaced.

**Provision Returns—how Balances and Receipts are Verified.**—Before transmitting A.F. F 735, the O.-in-C.-S. will examine the accounts carefully; he will see that the balance brought forward as remaining in each hospital agrees with that shown on the last day of the previous account, and that the *receipts from contractors agree with the contractors' bills* which he has certified for payment, and generally that the computation of the form is correct. For these purposes he will keep the necessary records in his office, but the original accounts received from M.Os., A.F. F 735, need not be copied, as in the event of any question arising the original can be supplied from the War Office.

The check can be done in this way if the O.-in-C.-S. takes a blank form (A.F. F 735), and at the top enters in each item shown as "remaining" in store on the last day of the previous account, but he must satisfy himself by taking stock that the remainings are correctly returned, for a steward starting with a fictitious balance may go on for some time—it has so occurred—but the start should be fair. The totals of the steward's receipts to the contractors for groceries, spirits, bread, meat, etc., must agree with the contractors' bills, and all must tally with the several amounts shown in the accounts as received from all sources by the steward.

The expenditure must agree with that shown in the daily "Abstract of Diet Sheets." When the account is found to be

correct, the O.-in-C.-S. notes the "remainings" for the month in the line under the record for the previous month, and by it he can check the articles which will be shown under the head of "remained" in the account for the preceding month; in this way one copy of A.F. F.735 for each hospital in the district will do for twelve months as a record to balance the account by and for the purpose of stock-taking by the O.-in-C.-S.

**Comparison of Diet Sheets with Accounts as a Means of Check.**—The diet sheets, A.F. I1202, and the extra sheets, A.F. I1205, will be compared with a monthly account at least twice a year, at uncertain periods, and without previous notice. At out-stations the O.-in-C.-S. will obtain the diet and extra diet sheets from the local M.O., and, after comparing them with the account, will promptly return the sheets for transmission to the principal M.O.

**Receipts—where to be Entered.**—Under this arrangement the receipts from contractors will not be entered in the receipt column of the supply account, except at stations where a reserve of hospital supplies is kept. At all other stations the entries in A.F. F.735, which will be sub-vouchers to the account, will be sufficient.

On no account should bills be paid unless the receipted vouchers accompany them. Dishonest stewards have been known to keep two accounts—one at the hospital agreeing with the stock in store, and the other sent in to the O.-in-C.-S., showing what ought to be there according to receipts and issues.

**The Steward's Provision Store** in a station hospital is merely a supply store for small quantities of such supplies as groceries, and a few bottles of spirits, wine, or beer. Bread and meat for issue are brought to the steward as required by the contractors daily.

The circumstances are exceptional where any articles of provisions in a station hospital store shall exceed 15 days; for most articles one week's supply will be sufficient.

If the system of check laid down be carried out by the Q.M., and the audit—to which the M.O. is entitled—by the O.-in-C.-S., any attempt at fraud can be detected before much loss to the public will occur.

**Supplies of Medicines and Medical Materials.**—These are obtained by requisition half-yearly, 1st April and 1st October.

"Demands for medicines and surgical instruments and materials are not included on the same form; the former will be indented for on A.Fs. I1209 and 1213, and the latter on A.F. I1219.

"From foreign stations the requisitions in duplicate will be annual, dated the 1st April, on A.F. I1213, with returns verified by Boards of Survey, on A.Fs. I1211 and 1215, for the year ending 31st March."—*M.R.*

**Local Purchase of Medicines, etc.**—Medicines, leeches, ice, or other articles or appliances not mentioned in the list laid down for medicines and medical materials, if purchased locally without the previous sanction of the P.M.O., will not be allowed at the public expense, except under circumstances so urgent as not to admit of reference.

All such purchases must be certified by the M.O. as "having been absolutely necessary," and obtained on the best and cheapest terms. The bills will be sent to the P.M.O., who will approve of them for payment if abroad; at home he sends an abstract of all such bills to the D.G. at the end of each quarter, on A.F. I 1210, for his approval.

*Ice* for strictly "medical purposes" obtained in this way differs from that issued by the Supply Department for the cooling of drinks or preserving food; the two should not be confounded.

*Vaccine Lymph* is obtained on requisition through the P.M.O.

**Hospital Stoppages.**—The account of hospital stoppages, A.F. O 1643, is prepared monthly in duplicate—one copy for the C.O. in whose payment the man under treatment is. Stoppages for a regiment are now prepared by companies, and are directed to be sent to the paymaster. The second copy of the account is retained in the office of the station hospital.

This account, or stoppage return as it is frequently called, is made up by the wardmaster or assistant wardmaster, who keeps the admission and discharge book. The names of men admitted ought to be filled in daily in the account, in the same order in which they occur in this book. A.F. O 1643 is supplied on whole, half, and quarter sheets of paper, used according to the number of men belonging to different corps and companies for which required.

**To Keep Stoppage Accounts.**—A whole sheet might be laid into the admission and discharge book; as the book is filled in, so can the sheet be, with each corps by companies at the station entered under a separate heading and according to their order of admission. This sheet will do as the office copy, and no trouble will occur at the end of the month if it is kept up daily as it ought to be. In the larger hospitals, where many corps supply the sick, and the admissions are numerous, a separate sheet should be kept for each corps in the garrison, and one for details.

The Q.M. is responsible for the preparation of these accounts, "and will check, initial, and submit them to the M.O. in charge for signature and transmission" to the paymaster or C.O. of each troop, battery, or company.

The day a man is admitted to hospital he is not to be shown as on either hospital diet or stoppages, but on the day on which discharged he is returned on both; so the days of hospital stoppages are the same as those days the man was in receipt of



hospital diet—both the same number of days and the same days. But the number of days under treatment in hospital, the duration of the disease recorded in the man's medical history sheet, is one day more, a day in advance of the hospital stoppage and diet returns, while the entry in the admission and discharge book is a day in advance of the diet returns.

**Invalids Leaving Hospital** early in the day, either to embark or transfer to another hospital, should not, as a rule, be placed on diet or stoppages for that day, but they can get a breakfast of bread and tea before starting, and this is to be shown as an extra on their diet sheets.

**The Account of Stoppages**, A.F. O 1643, only gives a nominal roll of men against whom they are to be charged, showing the periods for which they are charged and the nature of the charges, that is to say, ordinary stoppages, etc.

**Forfeitures of Entire Pay**, on account of sickness due to offences committed by soldiers, are entered in A.F. O 1644 (*see* Q.R., sec. vi., para. 48). The total number of stoppages must agree with the total number of diets shown in the return as issued to the men of a corps.

**Rate of Stoppages.**—The ordinary hospital stoppage for a man is 7*d.* each diet, and for a boy 6*d.*, that is under 18 years of age in the regulars or on the permanent staff of the militia. The ordinary rank and file of the militia are regarded as men irrespective of age; here there are no boys. Pay will not be allowed for militia men detained in hospital after the termination of recruits' drill, preliminary drill, or training; they will be entitled to free subsistence in hospital from the date of their ceasing to receive pay.

From this date they will be omitted from A.F. O 1643; and in the steward's store account, A.F. F 738, they will be entered in the column for "free diets."

The reason a militia man is exempt from hospital stoppages under the foregoing circumstances is manifestly due to his not being in the receipt of pay.

The "account" also shows the number of days for which stoppages are due for medical comforts, the rate being 6*d.* for each day they are issued to the men in non-dieted hospitals—*i.e.*, hospitals where men get barrack rations instead of hospital diets. But in the event of such an issue being necessary, "copies" of the daily diet sheet, A.F. I 1202, on which they are ordered must be sent to the O.-in.-C.-S. with the abstract of hospital stoppages for the month. This rule does not apply to field hospitals, although non-dieted, as men are not liable to hospital stoppages on service.

The total amount of hospital stoppages is credited to the cost of food, none of it goes towards the reduction of medical expenditure.

*Warrant Officers*, as a rule, are treated in their own quarters; although shown in the returns of the hospital as admissions, they are not placed on diet or liable to stoppages.

**Errors in the Return.**—If there is any mistake in the stoppage return the paymaster will re-transmit the account to the M.O., pointing out what men are included who are not in his payment, and supply any information in his power. Failing this being done, he will be held responsible for the stoppages stated in the return.—*Al. Reg.*

**Notice of Transfer of Men in Hospital.**—Whenever patients in hospital are transferred from one corps to another, so that there is a change of C.Os. and paymasters, notice of the transfer should be sent to the M.O. in charge of the hospital where the man is under treatment. Transfers in the R.A. and R.E. are directed in the M.R. to be made monthly, as transfers of men in these corps are more frequent than in battalions or regiments, but in all cases notice ought to be given, otherwise inconvenience and loss of time will occur in the recovery of hospital stoppages, which are now furnished by troops or companies.

So far as the M.O. in charge of a hospital is concerned, the account of stoppages is a nominal roll of men showing the number of diets given to each during the month.

**Acknowledgments for Stoppages.**—In A.F. O 1643 the form of acknowledgment is printed at the bottom of the page, to be signed, cut off, and returned. This slip is then pasted on to a column left for the purpose on the abstract of hospital stoppages for the month, which passes on through the O.-in-C.-S. to the Accountant General. These attached slips show the number of diets charged against the various corps, but not their money equivalent. In cases of free diet being issued during the month, or stoppages other than ordinary rates charged, a copy of A.F. O 1643 as a nominal roll must accompany A.F. F 738. As the paymaster only acknowledges the correctness of the numbers of charges, this abstract shows on whom the exceptional charges are levied and what paymaster is responsible for crediting them. Again, it prevents mistakes being made in cases where the diets should be a free issue.

**Abstract of Hospital Stoppages.**—This abstract is printed on the first page of the monthly statement of provisions, A.F. F. 738, compiled by the steward and forwarded to the O.-in-C.-S. by the third day of the month after the one for which it is prepared.

**Women and Children.**—The several rates of hospital stoppages are shown in this abstract. Women and children borne on the strength of their corps, if patients in the female hospital, are not charged for their diets, and the servants employed at a female hospital, cook, nurses, etc., are also entitled to a "varied

hospital diet " free ; but women and children not on the married roll of the regiment, if specially admitted, are charged 1s. or 6d. respectively for each diet.

Diets in hospital and extras at all times when issued to women and children, certified by their C.O. to be borne on the married roll of the corps, are not charged for. The certificate on A.F. I 1205 should thus be signed in case of out-patients previous to the first issue of extras. Also that on the ticket of admission into hospital, A.F. B 247, which in addition contains a certificate signed by the M.O. as to the nature of the disability of the person requiring treatment. In all cases where women and children are dieted in hospital the admission ticket should accompany the abstract of stoppages for the month. See **M.O. Doing Duty with Troops in Barracks.**

A schedule of persons entitled to hospital diets and rates of stoppages may be found in the Allowance Regulations.

**Marine Forces.**—Whenever it is necessary to treat men under Admiralty authority in a station hospital, the sanction of the O.C. the station must be obtained for their admission, and recorded in a separate admission and discharge book. Whenever these men are dieted in military hospitals a copy of A.F. O 1761 is to be attached to the monthly abstract of stoppages, where they are returned as men under ordinary stoppages ; a copy of A.F. O 1761 is also sent at the end of the quarter to the Director General, Medical Department of the Navy, Spring Gardens, London.

In A.F. F 738 the letter (c) in the fifth column is evidently printed in error ; it should be (e), *vide* classification of hospital stoppages, para. 82, Allowance Regulations '87.

**Militia Men** when kept under treatment in hospital after the expiration of the time allotted for their training should be shown as on free diet, in the column set apart for that purpose in A.F. F 738 ; but this column is not as yet printed in the abstract of hospital stoppages, A.F. F 738.

**Soldiers Admitted from Prison**, who receive no pay, are in the same financial position as a militia man after the expiration of the period of training. A soldier under sentence to be discharged the service at the expiration of imprisonment ought to be returned as on free diet. I know of no authority for returning them in this way, except it is obvious that if they are to receive no more pay, no stoppages can be made on account of their subsistence.

**Washing.**—Each soldier in barracks is supplied with one palliasse, one bolster case, two sheets, three blankets, and one brown leather strap, which goes round the bedding when rolled up during the day. Barrack sheets are different from those used in the hospital ; the latter are made of cotton, the former linen. The grey general service blankets used in barracks, are sometimes used in hospitals.

The washing of bedding in use by the troops in barracks, and of both bedding and clothing in hospitals, is done at the public expense, and by the O.-in-C.-B., except in the field, when a certain number of washermen—soldiers from the reserves—are attached to each field and stationary hospital; but the materials, such as soap, soda, etc., are issued by the Supply Department on requisition. Washing required for patients' things on board hospital ships is undertaken by the Admiralty; field hospitals not being equipped with hospital clothes, patients in these hospitals use their own uniform and underclothing.

When regiments are serving in India the mattresses and pillow-cases are washed quarterly, by the men themselves, without any remuneration. The Q.M. supplies the scrubbing brushes and soap.

In female hospitals the nurses and servants are required to wash many articles of clothing. For washing barrack and hospital bedding separate accounts are kept by the O.-in-C.-B. The requisitions for exchanging barrack bedding when dirty for clean, are made on A.F. F 704; for hospital bedding, A.F. F 702. These requisitions are called *certificates of exchange*. When complied with an entry of the transaction is made in the bedding books.

Barrack bolster cases and palliasses in use are washed every 90 days, sheets once a month, and blankets every year. Each soldier in barracks is supplied with three blankets and two sheets. If these articles require to be washed before having been in use the prescribed period by regulation on account of their becoming unduly soiled through neglect on the part of the soldier or in case of disease, if he neglects to report himself sick, he will be charged the contract rates for washing. To cover the expense in case of illness a medical certificate is required that the man did not neglect to report himself sick.

Exclusive of this washing, a soldier has to pay for the washing of his own personal effects from half to one penny a day. This is usually done in the regiment by soldiers' wives, and charged for in his company accounts.

Bedding and clothing used by a soldier or patient suffering from an infectious disease must be thoroughly fumigated or otherwise disinfected before being sent to the O.-in-C.-B. or washing contractor.

**Hospital Washing.**—Soiled articles are removed by the N.C.O. in charge of the Government laundry or by the civilian contractor twice a week, say Tuesdays and Saturdays; those articles given out on Tuesday are brought back clean on the following Saturday, and the articles which have accumulated in the soiled linen store at the hospital are then removed, to be returned clean on the following Tuesday, and so on.

All articles that require to be washed are entered by the steward in Army Check-book 200. This entry is signed by the



contractor or other person deputed to take them over in acknowledgment of having received them, and at the same time he is given a corresponding list signed by the steward who handed them over to him.

On receipt of clean clothing, the steward should see that they have been properly washed. Things not considered satisfactory should not be accepted, and the circumstances reported to the Q.M. or M.O. in charge of the hospital, as the case may be.

A N.C.O. of the A.S.C. attends at the exchange of articles between the steward and contractor. He represents the O.-in-C.-B. during the transfer. His presence may tend to prevent any misunderstanding between the parties during the transaction. This N.C.O. keeps hospital bedding and clothing account and washing book and A.B. 175, in which all articles of soiled clothing, etc., are entered and signed by the contractor in acknowledgment of his having received them. When they are returned clean this book is signed by the steward who received them over.

A Q.M. attached to an hospital, "if required," will have these washing transactions conducted immediately under him; he will then sign the book 200.

When washing is done at a Government laundry some distance from the hospital, and no N.C.O. is available to deliver the things, they may be passed under "convoy note" to the hospital.

It is estimated the average number of articles which require washing in hospitals is in the proportion of 60 or 65 for every 30 diets issued during the month. Thus twice the total number of diets for any one month will closely approximate the total number of articles which ought to require washing during the month. Many cases tend to vary the rate, such as special causes of disease, or the quickness with which men are passed through the hospital, the use of mosquito curtains, ophthalmic napkins, etc.; consequently this is not a fixed rate.

At the end of each month abstracts or lists from Army Cheque-book 200 are made out on A.F. F 762. All articles of patients' personal equipment are shown in this abstract, except pillow-cases and sheets, which are included with the articles shown on the abstract, A.F. F 702, for bedding, etc. These forms, prepared in duplicate, enable the O.-in-C.-B. to check the contractors' bills.

A patient in hospital has his white shirt, hand-towel, and handkerchief changed twice a week—also, if allowed up, socks; and his sheets, pillow-slip, and flannel shirt once a week; but all articles are changed if at any time considered necessary, including his blue clothing and neckerchief.

In order not to interfere with the M.O.'s visiting hour, or the issue of patients' personal equipment to men admitted, etc., the exchanging of linen and clothing in the wards should take place either in the morning after breakfast or immediately after

2 o'clock parade. The former hour is the one usually selected, but, as a matter of interior economy in a large hospital, I adopt the latter, as the wardmasters know by 12 o'clock—the hour when they send in their requisitions to the steward for the clean articles they require—what men are discharged, and do not require these changes; again the steward, having finished his supply accounts, and such as are in connection with the pack store, etc., can attend at the linen store and arrange the issues for the divisions. Moreover, this hour does not interfere with the morning parades of the corps. The requisitions on the steward show the number of each article to be delivered at the soiled linen store.

Wardmasters should see that the round towels and those issued to the patients, or their sheets, are not used for purposes other than those for which they are intended.

If at any time the number of articles exchanged exceed double the number of diets drawn during any period, the steward ought to inform the Q.M. or M.O. in charge. The file of wardmasters' requisitions for clean articles will show for what division the greater number of articles were drawn.

As a means of economy in washing, sheets which have been in use one day or so may be used to put under patients suffering from dysentery, enteric fever, &c. To such an arrangement there can be no objection.

In case of the occurrence of small-pox, scarlet fever, diphtheria, or cholera, special arrangements are made for purifying and washing clothes.

The officer who is the expense store accountant should balance his washing account book at the end of each month or quarter, according to the terms of contract, and satisfy himself that the account is correct before he authorises the payment of bills. Government laundries are inspected quarterly by him; and half-yearly, 30th September and 31st March, stock is taken and all accounts adjusted.

**Washing Necessaries on Admission.**—A soldier admitted to hospital has the underclothing he wears at the time of his admission washed at the Government expense. This is done under a contract separate from those for either barracks or hospitals. The rate is from 3*d.* to 4*d.* for each man admitted. It is intended to cover the expense of cleaning the underclothing the soldier has on at the time of his admission—three articles, shirts, socks, and towel; also, in mounted services, drawers. Any article found soiled in his kit should either be washed by the washer of the man's company, whom he pays, or wherever he is entitled to have them washed, otherwise the washing of these things may become a charge against him. A certificate is sent to the O.-in.-C.-B., at the end of each month, stating the number of men whose things have been washed during the month under this contract. The number shown can never exceed the

number of admissions during the period covered by the certificate. As a rule these numbers will correspond. Exceptions occur in the case of warrant officers being treated in their own quarters, although returned as admissions to hospital. Again, soldiers may be discharged from hospital before their things are washed.

When the articles of wearing apparel sent to the wash at the time of the man's admission are returned, the pack storekeeper will correct the kit inventory accordingly.

This washing is generally undertaken by the pack storekeeper, or someone of the hospital establishment, and in many cases has begun to be looked upon as a perquisite. Sinécures in the service are likely to engender an unsoldierlike undercurrent of intrigue.

**Repairs to Hospital Clothing** and bedding, as a rule, are undertaken by the contractor for hospital washing; the number of articles requiring to be repaired during any one month should not exceed the rate of from 8 to 10 for each patient on diet during the entire month. Thus the total number of articles repaired ought not to exceed the total number of diets, minus the last figure.

On the return of clean linen from the contractor, a list of the articles that have been repaired are usually entered by the steward on the back of the counterfoil of Army Cheque-book 200. At the end of each month an abstract from this is made on A.F. G 961. This is rendered in duplicate to the O.-in-C.-B.; it enables him to check the accounts of the contractor for repairs before authorising payment.

**Barrack Damages, General and Personal Charges, Barrack Services.**—In addition to the half-yearly inspection of supplies at the hospital, the O.-in-C.-B. will make inspections of stores in possession of troops in barracks and hospitals in the months of April and October, and will visit every room in the building in charge of the troops, except officers' quarters. He will report to his superior officer that he has inspected all the stores in the wards and accessory buildings of the hospital on inventory. The dates on which these inspections take place will appear in orders.

The form used for the report is A.F. P 1956, lost, damaged, or destroyed, and chargeable to a corps. For periodical or marching-out reports the same form is used. The Q.M. M.S. on these occasions will furnish the inspecting officer with such information as may be necessary to enable the damage to be assessed against the corps whose sick have been treated in the hospital or against the hospital establishment, as the case may be.

**General Charge.**—Whenever a general charge is made against a station hospital for barrack services, A.F. P 1956 is sent to the M.O. in charge, showing the gross amount and items

charged for. This form is signed in two places by the O.-in-C.-B., certifying "that after making every allowance for wear and tear, the above is a just and true statement of the damage and deficiencies;" and again, he certifies "that the cost of making good the above damage and deficiencies is as detailed."

The M.O. portions out the sums chargeable against the hospital establishment or the corps whose sick have been treated in the hospital during the period for which the damage is assessed; he then returns the form without signing it. The statement as to the distribution of the charge accompanies the "form."

In dividing charges among troops whose sick have been treated in the hospital, take the total number of hospital stoppages for the period from the office copy of A.F. O 1643, then the total number of stoppages against any one corps will be its equivalent proportion of the general charge. E. 9 the charge is 100 shillings, total number of diets 2,060; R.A. 206 diets, charge against R.A. 10 shillings, and so on. Calculate for each corps until the entire amount is proportioned out.

On receipt of the M.O.'s statement the O.-in-C.-B. sends in the general charge, A.F. P 1956, to the C.O. of each corps concerned, showing the amount chargeable, and attaching a copy of that portion of the M.O.'s statement which concerns the corps. With these charges he also submits for liquidation whatever personal charges he may have against the men of their regiments or corps.

The C.O. after signing the form gives it to the paymaster, who remits the required sums to the district paymaster in whose district the hospital is.

In the case of charges against men of the M.S.C., the M.O. signs the form as C.O., and forwards the charge to the paymaster, who pays the amount in to the district paymaster, taking a receipt, which he retains as a voucher for the payment of the money.

If general charges are made on a marching-out report, the officer attending on behalf of the troops signs the report.

General charges are only admissible where the injury to property cannot be traced to an individual. In the event of the damage done only partially injuring an article, if repairable, the cost of repairing (after being ascertained) should alone be charged against the troops.

In case articles are so damaged as to be considered of no further use, not less than half the price of the article is to be charged.

Part-worn articles, no matter how long in use, are estimated at half the original cost. In condemning articles of equipment by medical opinion, or that of a board, it is necessary to bear this in mind. For articles deficient the full vocabulary price will be charged, except blankets and surgical rugs, which will be charged for at the rate of "blankets, grey, general service."



*Damage to stores by lunatics*, or patients temporarily insane, except in cases of patients suffering from delirium tremens, will not be charged against the troops, and the necessary repairs to stores thus damaged can be authorised locally.

In the event of articles being lost, burnt, or so damaged by lunatics as not to be repairable, they will not be struck off charge unless a certificate be given by the M.O. in charge "that no blame is attributable to a hospital attendant."

*Hospital shirts and sheets stained with nitrate of silver* will be marked with the letter D, and will be issued to hospitals for patients requiring to use that chemical. Any article not marked with the letter D, and subsequently found bearing stains of nitrate of silver, will be assessed to the extent damaged, and a charge made against the patient, unless the M.O. certifies "that the damage was unavoidable."

**Exchange of Equipment.**—All articles which require to be exchanged at the hospital or by a corps in barracks are entered on A.F. F 765, and sent to the officer in charge of the expense store monthly at an appointed hour and date.

The number and description of each article to be replaced are filled in at the hospital. The O.-in-C.-B. will fill in the columns, showing whether the articles are repairable, or unserviceable through fair wear, or chargeable against the troops. In the absence of a Q.M., the M.O. in charge signs the return. When the cost of repairing the article shown as injured by fair wear and tear on this return is ascertained, A.F. G 961 is filled in, showing the name of the article and the sums for which it can be repaired, etc. The form is then sent to the M.O. and C.O. for signature. As this return is purely a barrack service one, for the correctness of which this department alone is responsible, but little is gained by sending it round to corps to show that certain articles used by them are going to be repaired at the Government expense.

No period can be fixed for the duration of mops, brooms, scrubbing-brushes, or articles of this description. They will not be exchanged until unfit for further use.

**Personal Charges—how Made.**—The wardmaster will report at once to the Q.M., or, in his absence, to the steward, all damages and deficiencies in wards chargeable to patients, orderlies, or others, in order that the same may be entered and recovered by means of the personal charge book, A.B. 51.

Each leaf of this book is composed of one charge and three counterfoils, and is retained by the steward, who is responsible that it is correctly kept, and that charges for damages and deficiencies are properly assessed and recovered in the following manner:—

The first portion of the book above mentioned, which is the charge, after being signed by the steward and M.Os., together with the first counterfoil attached thereto, will be forwarded to

officers commanding corps concerned. The counterfoil thus signed will be signed by him and returned to the M.O. as an acknowledgment of the charge. It will then be gummed on to the final counterfoil of the book, and retained as a hospital record.

On the back of the charge it is notified to officers commanding that the damage report, A.F. 1956, will be sent to him by the O.-in-C.-B.

**Issues to Complete Deficiencies.**—On the 25th of each month, or oftener if necessary, an *Abstract of Personal Charges* (see M.R.), together with the second counterfoils, will be forwarded to the O.-in-C.-B., who will on receipt of the same make the necessary issues, so that no alteration in the number of articles on inventory will occur. Should there be an inspection of the steward's stores in the interim between the time the charges were acknowledged and the date of issue of the stores, the first counterfoils, which are signed by the men's C.Os. against whom the charges are made, will account for the deficiencies required to complete the number of articles on charge.

**Recovery of Charges.**—In making out the charges the price of all articles will be filled in by the steward from the priced vocabulary of stores and priced list published annually in A.O.

On receipt of the abstract of personal charges from the M.O., the O.-in-C.-B. will prepare, sign, and forward for signature of the M.O., A.F. P 1956 in triplicate; herein will be shown the amounts due from corps; one copy will be sent to the district paymaster, one for information of C.Os., and one retained by the O.-in-C.-B.

C.Os. will cause the sums charged to be recovered, and will transmit the amount, together with any sums due for general charges, to the district paymaster in whose district the hospital is situated.

A M.O. should insist on having all charges laid before him by the wardmaster as soon as possible, in order that he may inquire into the cause. The loss or damage may be indirectly due to carelessness or neglect on the part of the hospital staff.

Charges should be sent to C.Os. at once, and not allowed to remain over until the end of a week, or until the man is leaving hospital.

It is advisable to have the soldier's signature on the back of the charge against him; although there is no authority for this, it will materially prevent him from subsequently disputing the charge in his company accounts.

**Accidental Breakages.**—When equipment is damaged by fair wear and tear, or has lasted its full term, it may be replaced. No charge will be admissible against the public on account of accidental injury to equipment; but in the case of glass or

crockery ware becoming broken, purely by accident, the M.O. may certify to that effect, when no personal charge need be submitted.

**Library Books** in use in hospital are under charge of the wardmaster.

In the case of personal charges being made against a patient for injury to a book, one of the intermediate counterfoils of Army Book 51 is used as a slip to place in the book so injured. This slip should be signed by the man. At the next inspection, when the damage is assessed, the charge will be sent to the man's C.O.

It may be stated that Army Book 51, is not used in making out personal charges on the R.E.Dep.

**General Charges by the Royal Engineers' Department** are made at the quarterly or monthly inspection, or on the departure of troops from a station.

"Requisition and Estimate of Repairs of Buildings," A.F. P 1923, is used on these occasions to record the particulars of damage, etc., "which have been necessary in consequence of neglect or wilfulness on the part of the troops." Although the sum charged and recovered is distributed and recovered on the same principle as in the case of barrack charges, the mode of procedure is somewhat different; for here there is no price vocabulary as a standard by which to fix the charges. It is difficult to arrange any standard measure for such a variety of work as that connected with the R.E.Dep., and in some instances it is difficult to convince officers commanding of the justice of the charges against their corps.

When any portion of the fabric of the hospital buildings, or fixtures thereunto belonging, are found at the inspection of the R.E. officer (who is accompanied by the Q.M. or other officer Medical Staff) to require repair on account of neglect or damage done by the occupants, the damage is noted. The contractor, together with the foreman of works, if not present, is sent to inspect or measure the piece of work, and ascertain the cost at which the article can be repaired or replaced.

When the service is complete, the foreman of works sees that it is finished correctly. Military foreman of works is an appointment made by selection from among the N.C.Os. It is laid down as his duty to superintend works in progress and measure incidental work and small services. The amount, according to the extent and nature of the work, in accordance with contract rates, is monied out by the R.E.Dep. on A.F. P. 1923, and signed by the C.R.E., to the effect that it is "a just and true estimate of the expenses of making good the damages and deficiencies." The S.M.O. signs the form in two places, in one to acknowledge the justice of the charge, and again in acknowledgment of the completion of the work. If the M.O. in charge

is satisfied as to the correctness of the statement of damage, he gets the Q.M. to portion out the different sums to be charged against the corps "whose sick have been treated in the hospital" during the period for which the damages are assessed. As in the case of general charges by the O.-in-C.-B., the portion of the charge to be paid is not arranged according to the strength of a corps at a station or in barracks, but according to the numerical strength of each corps in hospital, as shown by the average daily sick occupying the building.

The station hospital is for the reception of all sick at the station ; but it is only in the proportion that corps make use of it that they are liable for any damage to the building, consequently a sickly regiment will be more liable for costs than a comparatively healthy one, and presumably they derive most advantage from the institution. In portioning out the sums of money chargeable against various corps, the numbers shown monthly in the "Account of Hospital Stoppages" sent through C.Os. to paymasters, totalled for the three months, or the period, will approximate very closely to the equivalent numbers, or share of charges to be made against any one corps, out of the total amount assessed as damages by the R.E.Dep.

"Damages in hospitals having been assessed as usual as a general charge against the hospital, the several items will be monied out on A.F. P 1923. This form will be transmitted to the S.M.O., who, if he has no intention of appealing against any of the charges, will sign the document, showing thereon the portion to be paid by each of the regiments or corps concerned. The M.O. will then return the form to the C.R.E., who will notify the several amounts to the A.A.G., upon which a garrison order will be issued, calling upon the several regiments or corps to pay in the sum due to the district paymaster."—*R.E. Regulations.*

At Netley and the Herbert Hospital each patient is charged one penny a week to cover the cost of repairing these damages.

**Personal Charges by Royal Engineer Department.**—We now see the different modes of procedure for the recovery of money from the troops at the station on account of general charges against them by the Barrack and R.E.Deps. There is also a difference in the way personal charges are submitted against individuals who are ascertained to have injured or destroyed property connected with the different departments. If a personal charge is made on account of damages to a fixture—breaking window glass—it will be dealt with as an ordinary barrack damage.

Requisition and estimate of the repair of buildings, A.F. P 1923, is forwarded to the R.E.Dep. If it is an individual charge, the name and regiment of the man chargeable are entered on the requisition; in the case of joint damages the names of



those implicated are entered herein. If the man or men decline to sign as acknowledging the justice of the charge, a certificate from the M.O. should accompany the requisition to the C.R.E., stating that he investigated the circumstance, and that the damage or destruction of property was traced to the man or men shown in the requisition. The M.O. has nothing to do with the amount charged for repairing or replacing these articles when injured or destroyed; if any man against whom the charge is made or his C.O. considers it excessive, an appeal can be made.

As a rule, all glass broken will be made good by, or at the expense of, the occupants of the room.

**Incidental Repairs** to hospitals, including the fences to hospital grounds, will be carried out under the R.E.Dep., the cost being charged by the engineer estimates. All expenses in connection with keeping in order hospital grounds, except the gardeners' wages and tools, will also be charged to the vote for works, although the responsibility of keeping the grounds in order will, in accordance with the M.R., rest with the Medical Staff.

**Fuel and Light.**—Some regulations concerning fuel and light. Quantity composing the ration, coal or coke, 1 lb.; wood, kindling,  $\frac{6}{7}$  lb.; candle, 1 oz. Candles when issued are paraffin or stearine for officers, warrant officers, officers' orderly-rooms and surgeries, and of the ordinary barrack description for all other ranks and services. Oil is differently estimated according to the description of oil and lamp in which burnt, estimated at so much oil for each hour the lamp is burning.

The terms "winter," "intermediate," "summer," used in the regulations are to be interpreted as meaning—winter, the period from November to March; intermediate, April, May, September, and October; summer, June to August.

Ward	-	-	Winter, 37 lbs.;	Intermediate, 18 lbs.;	Summer,	{ as required on medical certificate.
Surgery	-	-	25 "	12 "		
Kitchen	-	-	37 "	during all seasons.		
Warrant officers and 1st class staff-sergeants	}	—	37 "	26 "	20 lbs.	
2nd and 3rd class staff-sergeants, sergeants al- lowed a sepa- rate room, and soldiers on the married roll		—	18 "	12 "	12 "	
For every 12 men in a barrack- room	}	—	40 "	20 "		

For fewer than 12 men there are special allowances. For men on detachment an increased scale of allowances is made; but this does not apply to detachments of the M.S.C., their cooking being done in the hospital kitchen.

The issue of fuel for hospitals will be made in convenient quantities, "not exceeding one month's consumption," but a running account of fuel received and expended during the year may be kept with the Supply Department, to be balanced annually on 31st May.

**Gas.**—When laid on by the R.E.Dep., the supervision of the supply rests with the C.O. and Barrack Department.

*The fittings, pipes, regulators, etc.,* will be kept in repair by the R.E.Dep.

*The meters* are examined and tested by the O.-in-C.-B., who keeps a record of the gas consumed, and in order to prevent waste by defective burners, he is supplied annually (1st April) by the R.E.Dep. with a sufficient number of burners to replace defective ones.

*Allowance of Gas.*—In round numbers, one ton of coal will produce 10,000 cubic feet of gas; one cubic foot of gas is allowed for lighting 1,000 cubic feet of barrack-room or ward space.

*The ordinary burner* allows of the consumption of three cubic feet of gas in the hour, and is supplied and replaced by the O.-in-C.-B., as well as all glass globes, external or passage lamps, of which he has charge.

*External lamps* at hospital or barrack gates, also guard-room lamps, will be kept burning from sunset to sunrise, without reference to moonlight nights. "Gas will be turned on to barracks at the general stopcock half-an-hour before sunset, and to each building at sunset, and turned off half-an-hour after tattoo roll-call, except in the case of recreation-rooms, etc."

Gas is supplied to the hospital during the whole of the night, and its use regulated at the discretion of the Medical Staff, who should see that there is no unnecessary expenditure, and every precaution taken to guard against accidents from its escape.

The enforced sobriety, cleanliness, and regularity of a military hospital should not be overlooked as a means by which the observance of good order and discipline might be impressed upon the soldier.

The best administered hospital is one where the M.O. in charge of a ward is authorised to exercise as complete control as possible, compatible with central administration; and in like manner, the best regiment is one in which captains command their own companies. I do not mean to imply that there should be a delegation of the duties and responsibilities of the M.O. in charge. As well as the experiences gained in the treatment of disease, each large hospital at least might be made a more efficient school for the systematic training of juniors in hospital organization. The regulations provide for this, but I do not think they are sufficiently worked out or inquired into by administrative officers.

The competency of each individual member is the chief thing which makes any organized body efficient. Although a junior M.O. is as fully qualified to treat sick as his superior officer, and is responsible for his patients, still this duty requires to be supervised to see that it is conducted systematically, economically, and in conformity with regulations.

Not unfrequently there is a disposition shown in the interior economy of a hospital to regard the ward duties as if they were but secondary to the general organization and administration of the establishment. This is not altogether due to a forgetfulness that the entire organization is constructed on the *ward unit*, wherein the most essential work of the establishment is done, and to which all other things must conform and be subservient; yet whatever is necessary, although accessory even in a minor degree, it is requisite that it should be admitted into the general organization in order to complete the *hospital unit*, and so render it effective to fulfil its purpose.

The disposition here referred to is perhaps in a greater degree manifested throughout the service, where the technical training of men in the use of arms, and the essential qualities of a soldier in the different tactical units, are looked upon merely subsidiary to administration as a higher order of work.

## CHAPTER XI.

## MOVEMENT OF TROOPS BY SEA AND MARINE TRANSPORT.

**Classification of Ships.**—"A *troop-ship* is one of Her Majesty's ships commissioned as a troop-ship. A *transport* is a private ship wholly engaged for the Government service on monthly hire, or one wholly engaged by Government to execute a special troop service, though not hired by the month. A *troop freight-ship* is a ship in which conveyance is engaged by Government for troops, but which is not wholly at the disposal of the Government"—(*Q.R.*). *Store freight-ships* are employed for carrying cargo. *Cargo* means the lading or freight of a ship, but the term does not apply to live animals.

In troop freight-ships the troops on board are usually treated as 1st, 2nd, or 3rd class passengers; warrant officers are entitled to be treated as 2nd class passengers.

The period of the year at which troops from England should reach the various foreign stations is stated in the *Q.R.*

"A large force demands for its conveyance by sea a much larger number of transports than are kept for the regular service of reliefs. The Government troop-ships kept up for the service of periodical reliefs between the United Kingdom, our colonies, and India are the Indian troop-ships 'Crocodile,' 'Euphrates,' 'Jumna,' 'Malabar,' and 'Serapis,' each of which can carry 1,097 men and 58 horses. The Imperial transports are the 'Himalaya' and 'Orontes,' which can accommodate 1,097 men and 58 horses each; the 'Tamar,' with accommodation for 1,097 men and 10 horses; and the 'Assistance,' for either 800 men and 8 horses, or 160 men and 138 horses. The last is principally used for the interchange of troops at home."—*Colonel Furse.*

The East Indian Government have also some fine troop-ships, the 'Clive,' "Tenasserim," and "Canning." These ships were employed in bringing the East India contingent to Suakin in 1885, but are usually employed within the East India command.

**How Transport is Arranged for.**—The Director of Transport at the Admiralty arranges for the taking up of all marine transport. A register of ships suitable for this purpose is kept in this office, where are also worked out the requirements of the various military units under the heads: 1, short voyages; 2, voyages under seven days; 3, distant voyages. The scale of tonnage allowed for a man or horse varies with the length of the voyage; for a short voyage  $1\frac{1}{2}$  tons for a man,  $2\frac{1}{2}$  tons for a horse. For seven days 2 tons a man, 6 tons a horse. For distant voyages  $2\frac{1}{2}$  tons a man, 7 tons a horse, or 10 tons for a cavalry soldier and his horse. In round numbers, 52 cubic



feet will be required for a man, 126 cubic feet for a horse. This accommodation is estimated to include regimental arms, equipment, blankets, stores, and all necessary supplies for the 1st Line of Transport. Additional shipping will be required for the 2nd Line of Transport, with magazine stores, provisions, forage, tents, waterproof sheets, and hospitals. Equipment proceeding by transport is classified according as it belongs to the 1st or 2nd line. Camp equipment is not issued prior to the landing of the troops, but should be marked "First for Landing," as the issue of tents should be made immediately on landing. It is a principle in packing that the articles first required should be the last embarked; this applies also to the loading of waggons.

**Tonnage.**—The expression ton, although referring to weight in shipping, is generally used in connection with its equivalent of space, about 40 cubic feet. The gross tonnage at which a ship is registered is taken to represent the entire cubic capacity of all enclosed space, both above and below deck; by deducting all non-freight carrying spaces, the net tonnage is arrived at, practically 40 per cent. less than the gross tonnage; thus, 3,000 tons gross will be 1,800 tons net.

Marine transports will be required more or less at the following rates:—An infantry battalion, 1,096 men, 58 horses, 12 carriages, *two*; a cavalry regiment, 653 men, 618 horses, 10 carriages, *four*; a horse battery *two*, and so on; a division 30, an army corps 130.

**Hospitals.**—According to present arrangements, it is stated in the M.R.—“The personnel and material, and if possible the transport, of a field hospital will be embarked together in the same vessel, and sail with the division to which it is attached;” again—“The M.O. in charge will, before embarkation, satisfy himself and report to the D.G. that the hospital is complete in personnel and equipment in every particular,” that is to say, when the equipment is drawn by him at Woolwich from the Royal Arsenal and Herbert Hospital; however, it is practically impossible on these occasions that any man could satisfy himself as to “every particular.”

The personnel of the hospitals for the Suakin expedition—about 30 officers and 350 men—embarked in the transport “Calabria,” under the command of a M.O. This is a good plan, as the men, many of them from the reserves, are able to get practical instruction under their own officers on deck, and all can attend lectures on subjects having special reference to their duties.

**Boats.**—Transports require to be furnished with boats sufficient to effect the landing of a number of men at one time. To find the capacity of a boat and number of men it will carry, multiply together the length, breadth, and depth, and the product by 6; this gives the capacity in cubic feet. Strike off the last figure from this number, and it will give the number of men

it is capable of carrying. On an average, the aggregate number of cubic feet in a transport's boats will exceed the number of tons register of the vessel. The lesser the tonnage, the smaller but comparatively more numerous will the boats be; thus, a vessel of 1,000 tons will have 6 boats, while one of 3,000 tons may have only 10. In the details of shipping of a division it is said, the Medical Department will require two transports of 1,500 tons each, with 8 boats for men and 2 horse boats—total boats, 20.

It has been computed that a French army (complete in all arms) of 100,000, provided with transport at  $1\frac{1}{2}$  tons per head, could be landed in England. However, this is a debated question.

The following information relative to shipping is taken from a useful little book called "The Clerk's Dictionary:"—

**Ship's Papers.**—Papers with which a vessel is required by law to be provided, and the production of which may be required on certain occasions; such are the register, passport or sea-letter, charter-party, bills of lading, invoice, log-book, muster roll, bill of health, shipping articles, and the like.

**Shipping Articles.**—Articles of agreement between the master or captain of a vessel and the seamen on board, in respect to the amount of wages, length of time for which they are shipped, etc.

**Charter Party.**—An agreement in writing respecting the hire of the whole or a part of a vessel, made between the owner or master and the freighter on a determined voyage, and under certain specified conditions. No exact form of words is absolutely necessary, or could be used, as the purposes of such parties must vary considerably. Two copies are drawn out and signed by both the owner or master, as his agent, and the charterer or hirer, each party having one.

**Manifest.**—A document containing a specific description of a ship, with the list of the names of the passengers, and a description of the whole of the cargo, number, and marks of the packages, etc., with the ports of destination, made out and signed by the master before leaving port, to be exhibited at the Custom House.

**Bill of Health.**—A certificate given to the masters of ships upon leaving ports subject to contagious diseases, naming the state of health of the crew and port at the time prevailing. A *clean* bill signifies that the place was free from such diseases. A *suspected* bill intimates that no case had been reported, but that disease was suspected. A *foul* bill declares the port to be infected, and the same is implied by the want of either of the other bills. A *clean* bill exempts a ship from performing *quarantine* when it reaches the port for which it is bound, or any at which it may stop, but a suspected or foul bill requires it to go into quarantine for a number of days, according to circumstances.

**Quarantine.**—Specifically, the term originally of forty days, but now of undetermined length, during which a ship arriving in port, and suspected of being infected with a malignant contagious disease, is obliged to forbear all intercourse with the shore; hence restraint or inhibition of intercourse to which a ship is subjected on the presumption that she may be infected.

**Pratique.**—A licence or permission to hold intercourse and trade with the inhabitants of a place after having performed quarantine, or upon a certificate that the ship did not come from an infected place. The term is particularly used in the south of Europe. See p. 303.

**Lazaretto.**—A place in which goods landed from ships in quarantine are fumigated or otherwise disinfected previous to their being delivered.

**Lloyd's.**—A society or establishment of underwriters and others in London, for the collection and diffusion of marine intelligence, the insurance, classification, and certifying of vessels, and the transaction of business of various kinds connected with shipping. *Lloyd's Rooms* form part of the Royal Exchange. The name is derived from *Lloyd's Coffee House*, where there were formerly rooms for the same purpose.

*Lloyd's List* is a publication of the latest news respecting shipping matters, with lists of vessels, etc.

*Lloyd's Register* is a register of vessels, giving the tonnage, age, build, character, and condition of each ship whose owners conform to their rules, etc.

*Lloyd's Agents* are persons employed in various parts of the world, by the society, to transmit commercial news, render assistance to masters of merchant vessels, etc.

**Underwriter.**—The name given to the individual marine insurers at *Lloyd's* and elsewhere; so called because they *underwrite*, or sign their names to the policy of insurance, for the purpose of becoming answerable for loss or damage, upon certain conditions, for a certain premium per cent.

An *Austrian Lloyd's* was established in Trieste in 1853, not, however, as an association of indemnities, but for general commercial and industrial purposes.

According to the Q.R. and Admiralty Instructions, where a number of transports are required for the conveyance of a large force, the principal transport officer is to be considered for the time being in the light of an officer in command of a separate squadron.

Under letters of marque, privateers are commissioned to cruise against the commerce of the enemy.

Abroad, where there is no naval establishment on the station. or senior officer of the port, etc., the senior A.S.C. officer will carry on the naval transport duties. It is the duty of the senior transport officer to watch over the sanitary condition of transports. With him the military authorities will arrange for the

embarkation or disembarkation of troops, including sick and wounded. All hired ships have to be surveyed, chartered, and fitted.

**Board of Survey.**—Before tenders are accepted a ship is inspected by a mixed committee of naval and military officers under the presidency of an officer of the staff. None but first-class foreign-going steamers should be selected for the transport of troops for distant voyages, not under 1,500 tons, and with a height between decks of not less than 6 ft., but 6 ft. 6 ins. if possible should be obtained; for hospital purposes, or the transport of horses, 7 ft. is desirable. The troops should be berthed on a deck provided with side scuttles. The lazarette deck is for store-rooms, etc.

The advantages of large, fast, powerful, foreign-going passenger steamers over smaller ones or cargo vessels are both strategical and sanitary. On board this class of steamer the military units are kept more intact; a greater amount of certainty is ensured of the voyage being accomplished within a given time, and with least risk of capture by the enemy. Again, they are better ventilated and easier kept clean; while the duration of the voyage is lessened, they are capable of affording the greatest comfort and accommodation.

Wooden ships are cooler and more easily ventilated than iron ones, but if built of fresh or so-called "green timber" they are at all times objectionable whether old or new. The East India Government ship "Czarewich," employed as a hospital ship at Suakin for the East India Contingent, was extremely well ventilated by taking out a plank all round the troop deck. Ships of this class afford the best floating hospital accommodation, in many respects preferable to such steam-ships as the "Carthage" and "Ganges," which were fitted out and retained at great expense in 1882 and 1885. Before accepting a transport it is desirable that information be obtained as to the medical history of the ship. Some are less healthy than others, which are said to be in this respect "unlucky." Every ship must be seaworthy, but it by no means follows that leaky ones are unhealthy. A ship which has recently had cholera, yellow fever, scarlet fever, or diphtheria on board should on no account be accepted. The Board of Trade or Lloyd's Agency will probably be able to supply such information.

**Charter Party.**—Ships hired by the month are taken up for a specified time or by agreement; they may be retained only for the voyage. In the former case they are contracted for at a certain fixed rate per ton; rates differ according to the class of vessel, state of trade, etc. Ships used for cargo can be got at a cheaper rate than those required for troops.

**Fitting of Transports.**—Transports, it is said, can be fitted in about six days for men and for animals in about ten days. Soldiers and drivers should have a compartment of the ship to



themselves quite separate from the animals. They should be under rather than over the horses, but completely shut off from the foul air of the horse deck. The fore part of a ship being the coolest is best adapted for men, amid-ship for animals, as there is least motion there.

The following is in accordance with the specification for fitting transports. This may be useful in showing the system adopted in preparing accommodation for troops on board, and the appropriation, position, space, and fittings of the different parts of the ship with which a M.O.'s duties are chiefly concerned.

**Sleeping Places** for families of first-class N.C.Os. In all ships chartered for conveyance of troops, cabins are to be built between decks or in the deck-house for them. The cabins are fitted with berths, shelves, wash-hand stands, and mess table. Staff-sergeants themselves, and their sons (when over 10 years of age) will sleep in hammocks outside the cabins, and a suitable space is allotted as a mess place for them, screened off.

**Women and Children.**—These bed places are generally built in two tiers, two rows in each, with 3 ft. between the rows. The lower berth should be 15 ins. from the deck, and no berth nearer the ship's side than 6 ins. They are 6 ft. long by 2 feet wide, to hold one woman or two children under ten years of age. Infants under one year, berthed with their mother, are not to be reckoned. Berths when in two rows are divided by a partition of 18 ins. deep. M.Os., when on board ship, are not unfrequently harassed by mothers and fathers in order to obtain more accommodation for their families than this, the present regulation allowance, to which they are entitled.

**Berthing of Men.**—Men, including sergeants, are berthed in hammocks hung from hooks, 16 ins. apart for men, and 20 ins. for sergeants, and 9 ft. in length, locking in 18 ins. at each end. Thus the space occupied by a man will be 9 ft. by 16 ins., but owing to the overlapping lengthways—hammocks when occupied being spindle-shaped—the superficial space covered by them will be somewhat less than this.

**The Cubic Space** for a man in the troop deck, after deducting the hospital and all confined space, may be taken at not less than 52 cubic feet; 40 cubic feet is the equivalent of one ton of shipping. The Board of Trade require as accommodation for the crew, 72 cubic feet and 12 ft. deck space for each man. On this basis an estimate may be made of overcrowding.

**Latrines** are provided on deck, under canvas cover, at the rate of two per cent. of men for which the vessel is fitted. Arrangements are to be made to secure a constant supply of water to wash them down. *Urinals* are placed under the same cover as the latrines, and are lined with lead throughout.

**Wash Places** for troops are also on deck for ablution purposes. Five troughs or basins are provided for each 200 men fitted for.

**Hospital.**—A sufficient space will be appropriated in the most suitable part of the ship for the hospital, and screened off with canvas screens, fitted so as to roll up when required. Standing bed-places or bunks are built in one or two tiers, well clear of the deck and side of vessel, three for every 100 men fitted for, each 6 ft. long by 2 ft. wide, made like those for officers, but with iron lattice bottoms, 4-in. mesh. One or more of the nearest mess tables will be told off for the hospital. The hospital must be kept clear of boxes or baggage.

The scale of equipment for hospital for troops is as follows:—

Bath, zinc, 5 ft. long -	-	1 if under 100 men; 2 if over that number.
Spitting cups, pewter -	-	1 for every 100 men fitted for, or less number.
Urinals - - -	-	do. do.
Bed pans - - -	-	do. do.
Toilet cans, to hold 2 gallons -	-	1 for each 100 men or less number, but not more than 4.
Galvanised iron pails -	-	1 for each 100 men or less number, but not more than 2.
Hair brooms, 12 by 5 knots; 4 in stock, and fixed handles	1.	
Bass, scrubbing brushes, hand	2	for each 100 men or less number, but not more than 4.
Soft soap, for cleaning hospital and dispensaries.	3 lbs.	for each 100 men or less number per month.
Hexagonal safety candle lanterns.	2	for each 100 men fitted for, but not more than 6.
Thermometer, japanned, 10 in.	2	for baths.
Saucepans, quart and 3 pints -	2	of each; when over 500 men, double that number.
Tea pots, quart - - -	-	2.
Tea kettle, 2 quarts - - -	-	2.
Strong camp stool - - -	-	1 for each 100 men or less number.

Fyffe's water chairs for troops, 1 for every 250 men, and 1 for each additional 250 men. For women and children, for their exclusive use, 1 for from 10 to 60 women, with their children, and 1 for each additional 60.

A hospital is provided for women when 10 or more are carried.

**Dispensary.**—The dispensary is built on the aft side of the hospital bulkhead, inside the hospital screen. To be 6 ft. square, fitted with three rows of shelves and drawers, a wash-hand stand, as for officers, provided with basin, water-can, and soap-tray. A bracket is placed against the bulkhead for the filter. There is a swinging candle-lamp and globe in the dispensary. The door is fitted with a lock and key.

**Prison.**—A prison is constructed on the main deck for five men, each cell 8 ft. wide by 9 ft. long. Two prisons are required for

vessels carrying 700 men and upwards. Prisoners sleep in hammocks. These prisons are for men who commit offences during the voyage. Men embarked as prisoners are kept in the guard-room.

**Troop Galley and Bakehouse** must be on the upper deck, 6 ft. 6 ins. high, built so as to give the greatest possible ventilation. The deck must be paved with tiles, and the underneath part lined with sheet iron or stout tin. The size required is 30 superficial feet for the first 100 men, and 15 ft. for each additional 100. When the troop galley and bakehouse are separate more space is given. The owners of the transport supply the means of cooking. Cooking between decks heats the atmosphere and renders it damp, so it should never be allowed with troops on board.

**Inspection of Ship.**—A transport is inspected after being fitted out for troops prior to their embarkation, and “finally” when the troops are on board, the baggage stowed, and the ship in all respects ready for sea, the object being to ascertain whether the arrangements for the berthing of the troops, etc., have been carried out. The first of these boards is constituted as follows:—

The staff officer superintending the embarkation, an officer of the garrison not below the rank of captain, and one or more naval officers.

The senior M.O. at the station is to accompany the board to give his opinion on sanitary points.

The M.O. who is to proceed in professional charge of the troops should, if practicable, also be in attendance.

This inspection will, as a general rule, take place at the port to which the ship may first proceed for the embarkation of troops. At any subsequent port of embarkation the ship is not to be subjected to any further formal inspection before the troops embark.

This is the only inspection the P.M.O. or S.M.O. attends. They need not attend the final inspection.

**Inspection of Troops under Orders.**—Troops under orders for embarkation should at once be inspected by the M.O. in charge to ascertain each man's fitness for service.

This inspection should thus be made in order to give sufficient time for men to be told-off to replace those who may be deemed unfit to proceed on board.

The troops are subsequently inspected by the P.M.O. or S.M.O. of the district as to their general fitness. Men, women, and children are finally inspected when practicable on the day of departure from their station. In case this cannot be done, the inspection should be on the previous day.

Every man, woman, and child is to be carefully examined. All certified “fit” must be free from any contagious or infectious

disease, with the exception of slight cases of venereal among men proceeding on an ordinary tour of service, who are likely to get well during the voyage; but it is forbidden that such men be allowed to proceed on active service.

“To send a weakly man on active service is cruel to the individual, retards operations, renders them difficult, requires larger hospital and medical establishments, and the result is, if not actual failure, at least decreased efficiency and greatly increased cost.”—*Wolseley*.

*Nominal rolls* of men about to embark are made out in the orderly-room of the corps in duplicate before the primary inspection. One copy is sent to the P.M.O., and the other returned to the C.O. to accompany the men on board.

*Men Unfit*.—In case of any man being found unfit for the service on which he was about to embark, the cause should be specified briefly in the column for remarks. These men may subsequently be seen by the P.M.O.

*Venereal*.—A nominal roll of men suffering from venereal should accompany them for the information of the M.O. in charge on board.

This is without reference to invalids, for which there are special instructions.

*Women and children* should be under observation for some weeks previous to embarkation. Women within three months of their confinement should not be embarked.

The matrons of hospitals for soldiers' wives will assist in ascertaining the actual condition of women about to embark.

Children over three months old should be vaccinated. All women and children should have satisfactory marks of vaccination. The health certificate for soldiers' families is A.F. B 155.

Soldiers whose wives are unable to proceed will remain with them.

Officers' wives, families, and servants must also be certified as fit.

A M.O. may be suddenly and unexpectedly called upon to express a decided opinion with respect to the embarkation of troops among whom infectious fevers have recently occurred; uniformity of opinion in this matter is more desirable in the army than in civil life. See p. 303.

*Sea Kits*.—Immediate steps are directed to be taken by C.Os. in order to obtain extra clothing, sea kits, necessaries, and other articles required by the men during the voyage, as prescribed by the Clothing Regulations. Sea kits are not served out until the men are leaving barracks on the point of starting; these kits and valises are in charge of the man proceeding to port of embarkation; they are stowed on board in the racks over the mess tables. Special places are supplied for helmets. “Special care should be taken that every man embarking is in



possession of two pairs of boots in good and serviceable order, so as to be ready for the line of march on landing."—*Q.R.*, sec. xvii., para. 12.

**Railway Accommodation.**—A railway compartment constructed for 10 ordinary passengers is estimated to carry 8 soldiers, and a compartment for 8 will be told off for 6 soldiers as above. Invalids, for whom sick carriage is provided, if able to travel in a sitting position, are accommodated in the same proportion; on this estimate the demand for carriage is made.

It is surprising how things go astray, get put into the wrong trains at starting, and get stowed away on board and lost sight of. The archives of the *Q.M.G.'s*. Department must contain records of strange occurrences in these respects.

Detachments of 200 men and upwards are to be accompanied by a *M.O.* when proceeding by train or on the line of march.

**Troops proceeding Coastwise.**—When proceeding coastwise on board ship, detachments of 50 or upwards are to be accompanied by a military *M.O.*, except for short voyages in the United Kingdom on board *H.M.* troop-ships, when detachments of troops in full health, in numbers not exceeding 100 officers and men with their families, will be in the professional charge of the naval *M.O.* on board.

The following relative to *coastwise steamers* was published in *A.O.*, August '89.

"The space for troops to be not less than 72 cubic feet for each man, woman, and child, excluding hatches, stanchions, or other obstructions, *i.e.*, 12 clear superficial feet by 6 ft. in height. Each compartment must be well ventilated in addition to the hatchway. Women and children must not be in the same compartment with the men."

**Final Inspection of Transport.**—When troops are embarked at more than one port, this inspection takes place at the last port. Ships passing between foreign stations for the purpose of carrying out reliefs, are finally inspected before sailing on each occasion of the troops on board being changed. The board will consist, when practicable, of one or more naval officers, a staff or field officer, and a captain not proceeding with the troops; a *M.O.* not proceeding with the troops is to attend. Before commencing their inspection the board is to communicate with the *O.C.* of troops embarked, and request him to accompany them.

"*P.M.O.s.*, when finally inspecting troopships before troops embark, will be careful to ascertain that a sufficient number of *M.O.s.* and hospital attendants have been detailed, and that the regulated supplies of medical and surgical equipment (para. 98), of hospital clothing (para. 91), of books, forms, and stationery (para. 92), as well as a due supply of medical comforts, have been put on board; and also, that having regard to the duration of

the voyage, and particularly to the nature of the diseases of the sick and invalids embarking, any special supplies deemed necessary have been provided."

Observe the commencement of this paragraph from the M.R. does not refer to the final inspection of the ship, but to the previous inspection, which is the P.M.O.'s first and final inspection.

The medical and surgical equipment should not be taken out of the vessel during the period for which she is taken up. If the M.O. in charge disembarks, he should hand it over to the master of the ship.

**Some Duties of Medical Officers on Board Hired Ships.**—The "M.O. in charge" of the troops is to furnish the military C.O. daily with a report of the sick officers, men, women, and children under his care.

The appearance of any contagious or infectious disease is to be immediately reported to the C.O., who will at once consult the master, and they will take such steps as they may deem requisite.

Full particulars of births and deaths must be made in writing to the master of the ship by the M.O. with as little delay as possible, for register and insertion in the log.

The M.O. is to demand daily, before 10.30 a.m., the medical comforts, etc., required for the sick, and he is to give the master of the ship a receipt for the same when requested to do so.

He is to furnish a list to the C.O. before 8 p.m. every evening of such invalids as may require lights in their cabins during the night, in order that directions may be given to allow it.

In transports he is to take sanitary and medical charge of the ship and crew, and should frequently inspect the quarters occupied by the crew, calling attention to any neglect of cleanliness, etc. He should take great care that the bilges are kept sweet, and that as good a sanitary condition as is possible is maintained.

In troop freight-ships, if there is no ship's surgeon on board, the same course is to be followed.—*Q.R.*

On board the East Indian troop-ships, it seems, under special arrangements, a N.C.O. M.S.C. is placed in charge of the surgery, in which case he accounts for his charge to an Admiralty official at Portsmouth.

**Army Forms.**—The number of forms required on board are estimated for according to the length of the voyage. For their final disposal *see* M.R.

**Establishment—Medical Staff Corps.**—One compounder of medicines, one corporal, and three privates of the M.S.C., form the Army hospital establishment on board H.M.'s. troop-ships on foreign service, and in hired ships when considered necessary.

The compounder, in addition to his other duties, will act as *wardmaster*.

The corporal will act as assistant wardmaster and pack storekeeper.

*The pack storekeeper* on board ship should not retain in his possession any money or valuables belonging to the sick; there is no safe place provided specially for the Medical Staff in which to retain such articles. In case of men being admitted on board possessing money or valuables, the pack storekeeper will carefully note down the description of the articles taken over by him at the time of admission, and he will hand them over to the O.C. the troops and invalids on board. The pack store book, Army Book 182, will invariably be used in taking over the effects of sick in hospital. *See* p. 317.

**Money or Valuables belonging to Invalids—how Disposed of.**—In case of invalids being admitted on transfer from a hospital on shore, the M.O. in charge of the party should hand over directly to the O.C. the troops on board all money or valuables belonging to the invalids which he holds on their behalf.

The military C.O. should see that the above articles belonging to the sick are placed in security.

A chest or safe for money or valuables is given in charge of the O.C. the troops on board. Paymasters and naval officers are strictly forbidden to take charge of money, jewels, or valuables belonging to the troops.

A M.O. in charge of a party of invalids embarked gets his receipt from the officer in charge of this chest for any money, etc., he may have to hand over in connection with his charge. All money belonging to patients in hospital should be deposited in this chest.

On the death of a soldier at sea, the C.O. will at once have an inventory of his kit taken and of all articles of which he died possessed, and will see that they be placed in proper custody until disposed of.

**Berthing of Sick-Attendants.**—Men of the M.S.C. detailed for duty on board are berthed in hammocks, and have a mess told-off for them near the military hospital. If their number is not sufficient to attend on the sick, soldiers from regiments may be employed. The proportion of men thus employed is the same as laid down for hospitals. Under any exceptional circumstances a soldier may be employed as cook for the sick.

Soldiers employed as hospital orderlies do not include men employed as guards over lunatics. *See* p. 160.

**Discipline and Command.**—Small detachments or details of men embarked may, for purposes of discipline, be placed under one C.O.; so, for the time being, the power of command of the officer of any one detachment of a corps will remain in abeyance. Consequently, men of the M.S.C. on board are not necessarily under the military command of their own officers (*see* sec. vi., para. 15, Q.R.). Small detachments embarked are

returned on A.F. B 143, in duplicate, by their C.Os. From these returns the officer placed in command of the party makes out his embarkation return, A.F. B 126, called Embarkation Return of Drafts and Detachments.

Troops on board H.M.'s ships are under the command of the captain of the ship. Men remanded for trial by district court martial will be disembarked on the first opportunity. By an order in writing of the captain, a regimental court martial may be held on board, and, under such authority, *any* N.C.O. can be tried. The O.C. of troops embarked receives from the captain of the ship authority to award such minor punishments as are specified in the summary punishment table (*see* Q.R.). Summary punishments for which a warrant is required are awarded by the captain.

On board transports the command of troops is vested in the senior combatant officer doing duty with the troops. It may be remarked that the M.O. doing duty with the troops is not superseded in his appointment by reason of a senior officer of the Medical Staff taking passage on board.

In the absence of any specially appointed transport officer of the Royal Navy, the military C.O. on board is furnished by the naval authorities with a memorandum of equipment, No. 110 Transport. Herein is given an abstract of all equipment on board, showing where stowed, boats, berths, and hospital accommodation, also cooking, distilling, and ventilating apparatuses, with the estimated capabilities of each. In addition he is given a list of bedding, sheets, blankets, etc., as well as medical comforts and disinfectants.

I mention this so that a M.O. coming on board may know from whom to get reliable information concerning these matters. The C.O., when he requires it, can get from the master a copy of his regulations and charter party if necessary.

**Ventilation.**—Too much attention cannot be directed to ventilation. All hired ships should be fitted with Dr. Edmond's apparatus; his system is by "extraction," but where there is no accumulation of foul air the apparatus may be used for the perfusion and diffusion of fresh air by turning the cowl to the wind; the air runs down the main ventilators, along the air shafts, and out through the perforations which are made in the shafts as they run along between the decks. To extract foul air the action is reversed. An upward current is produced by means of a rush of steam through a cowl, which should be turned away from the wind; thus the foul air is sucked into the shafts through the perforations in their sides, and finally expelled. Hatchways, windsails, and cowls are the inlets by which the exhausted foul air is replaced. In this, as in all other systems of artificial ventilation, heat is the motive power. When the apparatus is employed to catch and distribute the natural currents of air, no heat is required.



A defect may arise in the application of Dr. Edmond's system, by which bilge effluvia might escape by passing through the openings in the deck air channels. To obviate this, the principle applied to barracks should be adhered to, and all the chief parts of the ship requiring ventilation should have separate outlets. I have heard of a case where Dr. Edmond's system did not act well, but it was found the air shafts passed through the ice-house. For the removal of pent-up air in recesses on board, a system of ventilation by extraction is to be preferred to one by propulsion, which in a confined space has a tendency to force back and corner the air.

REGULATIONS FOR HER MAJESTY'S TRANSPORT SERVICE, TO BE OBSERVED IN ALL SHIPS EMPLOYED BY THE LORDS COMMISSIONERS OF THE ADMIRALTY.

**Stores—by whom Furnished.**—Ships accepted as transports will be required to be provided by their owners with all the articles enumerated in Appendix XIII. of the above regulations, a long list, which is divided into boatswains', carpenters', gunners', engineers', and miscellaneous stores.

Bedding is provided either by the Government or the owners, and so are provisions and medical comforts.

**Messing.**—In case the owner by agreement supplies articles of food for messing, a certain daily rate is given which includes all such supplies and forage, for which the rate is 2s. a day for each horse. Usually at the expiration of four months from the date of leaving England the rates for first-class passengers are increased; so in the case of an officer being granted an indulgence passage, it may prove unprofitable to accept one in a transport four months after she was taken up.

The reason this increased rate for messing is granted is on account of transports engaged in China or India the owners may have a difficulty in obtaining provisions after being so long a time from home, but the same applied to Egypt.

**Medical Charge of Crew.**—Transports must be manned as is usual in first-class merchant ships, and will carry in addition an engineer for the distil, a baker for the troops, and such a staff of cooks and stewards as the surveyors may approve. Sailing transports must carry four men, steamers three men for every 100 tons register, and in proportion for fractional parts of 100 tons. The ship's officers are included in the manning.

According to regulations, a M.O. (if possible the one who is to have charge of the troops) will make a careful inspection of the ship's crew at the time of the first inspection of the vessel, and will immediately inform the naval inspecting officer of the result, reporting the same to the P.M.O.

The M.O. in charge of the troops, when the ship does not carry a surgeon, will take medical and sanitary charge of the crew and supply them with medicine from the public stock.

**Civil Surgeons.**—Remuneration will be granted to surgeons of transports, contract, and other passenger vessels, according to a scale for medical attendance, including medicines and all expenses on all *bonâ fide invalids only, when embarked as such*. In case of a Government passenger embarked in health requiring attendance fees will be paid. Claims for payment must be made on the proper form and signed by the military O.C. before disembarkation.

**Messing Arrangements—Transport Regulations.**—The following is a list of articles for the use of the troops to be provided by owners; it is worthy of note—"The Government will in no case be responsible for losses, condemnations, wear and tear of mess articles," etc. :—

Mess kettle, stout tin, to hold two }  
gallons with lid to form dish - } 1 for each mess.

Carving knives and forks - - - 1 pair for each mess.

Salt-jars - - - - - 1 No. " "

Mustard pots (to hold half a pint - 1 " " "

Pepper dredge - - - - - 1 " " "

Pickle jars (to hold 4 pints) - - 1 " " "

Oval tin dish - - - - - 1 " " "

Potato net (to hold 12 lbs.) - - - 1 " " "

Bread bag (to hold 20 lbs.) - - - 1 " " "

Pudding bag - - - - - 1 " " "

Zinc tallies - - - - - 2 " " "

Scrubbing brushes - - - - - 2 " " "

Washing tubs { to be in sets of 3, of  
22, 20, and 18 ins. di- }  
ameter respectively } 1 " " "

Wooden buckets (to hold 2 gallons) 1 for two messes.

Plates, tin - - - - - 1 for each person.

Pots, tin, pint - - - - - 1 " "

Spoons, iron - - - - - 1 " "

Water cans - - - - - Such number as ordered  
by surveyor.

Tins for baking bread (to hold 4 lbs.  
each) In the proportion of 15  
for 100 men.

Porter tub (to hold 20 gallons) - 1 for each ship.

Measures (Imperial) legally stamped 1 set for each ship.

Weights and scales do. do. 1 " "

Filter (for the hospital, size as or-  
dered) - - - - - 1 for each ship.

Culinary utensils and implements  
to include saucepans for cooking  
for the hospital and women and  
children- - - - - 1 set, to be approved by  
the surveyor.

A mess consists of eight adults; but should it be necessary to increase the numbers, the mess articles must be proportionately

increased. The number of each mess is lettered over it; on the port are even numbers, starboard odd.

"The mess utensils will be placed on the tables previous to embarkation, and the biscuit or bread for the day will be issued as soon as a N.C.O. is told-off to act for the Q.M."—*Q.R.*

**Cooking Utensils** are supplied by the owners, also a cooking galley complete of sufficient size to cook provisions at one time for the full number of troops the ship can carry, and the boilers to be of a capacity to contain three pints for each person. A separate cooking galley is provided for the cabin mess and ship's crew.

**Water.**—On board transports there must be one or more distils, capable of making in 24 hours  $1\frac{1}{2}$  gallons of water for each person carried, including the ship's crew, and 10 gallons for each horse or mule. Although 6 pints is the allowance out of the tropics and 1 gallon in the tropics, the arrangements for the daily supply of drinking water must not be less than 1 gallon a head. The distil is directed to be kept at work daily until the previous day's consumption is replaced. This ensures a sufficient supply being always on hand. The water must have time to become cold before issue. Iron tanks are required to hold 14 days' water at the rate of  $1\frac{1}{4}$  gallons per head per diem. The usual size of these tanks is 4 ft. in every direction, that is 64 cubic feet, holding 400 gallons, nearly 2 tons each.

"In the ordinary process of condensation the water passes over quite devoid of air, and is too often conveyed to the tanks at a high temperature, evolving steam, and precluding the absorption of air, which is always present in good-tasting and wholesome water. To meet this deficiency Dr. Normandy has devised a patented apparatus, which is not only economical, but an invaluable resource in a hygienic sense. (Normandy's apparatus consists mainly of three parts, viz.: 1, an evaporator; 2, a condenser; and 3, a filter.) The water condensed and aerated in this way is perfectly wholesome, and we have the satisfaction of knowing that it may be freely drawn from the tank without producing disease.

"The air begins to be expelled from water at a temperature of  $130^{\circ}$  Fahr., and is quite dissipated at  $212^{\circ}$ . Recently-distilled water therefore contains no air.

"From  $3\frac{1}{2}$  to 4 per cent. of salines, and much organic matter, render sea water unfit for domestic purposes, much less for drinking. Now, though the salts are left behind in the mother liquor, the organic matter is carried over in the process of distillation, having also undergone a certain change by previous contact with the heating surface. This change will be more perceptible in the flat and disagreeable taste of the water when the heat is intense, and, as a consequence, the process is more rapidly conducted. It has, moreover, been abundantly proved that

re-distillation does not quite free the water from these subtle organic matters, so that the more effective process of filtration is now very generally adopted."—*Macdonald's* "Naval Hygiene."

"Organic matter, at first offensive to taste and smell, in distilled water can be got rid of by passing through a good filter, or by keeping three or four days, or by the addition of a little permanganate solution.

"Care should be taken that no lead, zinc, or copper finds its way into the distilled water. Many cases of lead poisoning have occurred on board ship, partly from the use of *minium* in the apparatus, and partly from the use of *zinc pipes* containing lead in their composition. If possible, *block tin* should always be used."—*Parkes*.

Zinc sometimes contains lead, but the chlorides in water will act on zinc itself and produce a salt not precipitated by boiling.

Through defects in the process or apparatus employed, salt water may get into the condensers and render the water for drinking brackish. Water rather too salt for drinking by itself may be mixed with oatmeal or barley, or used for the purpose of boiling vegetables. See pp. 216, 394.

**Bedding, Hammocks, etc.**—These articles are to be provided by the owner or the Admiralty, as may be arranged in each case. The following, I find, is the same scale as laid down for H.M.'s troop-ships in the Q.R. and Admiralty Instructions:—

Bedding	}	For the hospital	Beds (containing 21 lbs. of hair)	-	5	per 100 men.
			Bolsters (containing 3½ lbs. of hair)	-	5	" "
Bedding.	}	For invalids -	†Cots	-	2	" "
			Blankets	-	10	" "
			Sheets	-	20	" "
			Sheets	-	4	for each person.
			*Hammocks, slung and numbered	-	1	for each sergeant.
		Sergeants -	Hair-bed for the hammock	-	1	" "
			Hair-pillow for do.	-	1	" "
			Blankets	-	2	" "
			*Hammocks, slung and numbered	-	1	for each man.
		Men	*Hammocks (spare), slung but not numbered	-	2	per 100 adults.
			Blankets	-	2	for each man.
			Do. (spare)	-	5	per 100 men.
			Hair-beds (in transports only)	-	10	" "
		Troops or third class passengers.	Hair-pillows (in transports only)	-	10	" "
			Hair-bed	-	1	for each woman or two children under 10 years.
		Women and children	Hair-beds (spare)	-	2	per 100 adults.
			Do. pillow	-	1	for each woman or child.
			Do. pillows (spare)	-	2	per 100 adults.
			Blankets	-	2	for each woman and 1 for each child under 10 years of age.

Laycord for clothes-stops (of a foot in length each), sufficient to supply four yards for each man, woman, and child, as required, on demand of the military C.O.

\* The clews must not be fitted with iron rings, and must have lanyards 3 ft. long spliced into each clew.

† Children of 10 years of age or upwards are to be considered as adults.



**Charge of Bedding and Mess Utensils.**—The Transport Regulations say—All the articles required under these regulations for the use of troops on passage, or any others that may be substituted for them, are, when issued from the public stores, to be in charge of the master of the ship. Other articles, such as clothing, although specially issued for the voyage, will be in charge of the troops.

Soon after embarkation the Q.M. will draw from the master of the ship the hammocks and bedding he may require for the use of the troops.

At 6 a.m., bedding for airing is taken on deck.

When troop bedding is unduly soiled, especially that used in hospital, it is to be soaked, wrung out, and dried preparatory to its being returned into store on board, although it will be ultimately landed for cleansing.

On board hired ships the hammocks and blankets are directed to be returned to the master of the vessel shortly before disembarking, "after dinner," or last meal on board. The troop decks are to be cleared up, and the "mess utensils" returned to the master.

In the event of loss, damage, or destruction of property on board, stoppages are made on the same principle as in the case of barrack damages, *i.e.*, personal charges or general charges.

In the Q.R. and Admiralty Instructions may be found a list of prices of bedding, mess utensils, etc. Hammocks, 4s.; blankets, 6s. 6d.; hospital bed, 1l. 5s.; cover for hospital bed, 4s.; hospital pillow, 4s. 6d.; cover for pillow, 1s.; hospital sheet, 4s.

I am induced to quote these few rates for articles which may not be forthcoming at the end of a voyage, as it is in accordance with such rates a medical or other officer, some months after the expiration of a pleasant voyage, may be called upon to pay. The last trip I was on, the C.O. had to pay over 5l. for hammocks and blankets. Usually the charge is portioned out among the troops; in all cases it ought to be settled before the troops disembark, but payment is not to be made to the master of the ship. During the entire period while on board, the M.O. must be on his guard against any collusion occurring between the ship's steward and his steward which would "let him in." A N.C.O., M.S.C., once appointed as steward on board a transport, should not, if possible, be removed until he accounts for every detail of his stewardship.

**Sanitation.**—With troops on board cleanliness, dryness, and pure air are necessary for their health. The troop deck and the entire ship under the main deck should be kept in as dry a state as possible. Washing and swabbing extensively between decks is a highly objectionable practice, thus keeping the troops in a humid, sweltering atmosphere, due to the evaporation from the wet and sodden planking.

When troops put to sea, river sand and sawdust, to which a little carbolic powder, perhaps, may be added, should be freely laid down. This will absorb the discharges from sea sickness, the whole being thoroughly cleared off on the following morning, and more put down. By this means the decks will be protected from contamination. After a few days the troop deck should be dry holy-stoned, and dry rubbed and scraped when necessary. Swabbing should only be employed where required on account of local patches of filth. By sprinkling with *hot dry river sand* and sawdust, holy-stoning and dry rubbing, the troop deck can be kept clean. The personal cleanliness of the men should be carefully attended to by their immediate C.Os. The hold and bilge should be kept as dry and clean as possible. The regulations state that coal is to be shipped in as dry a condition as possible. The same as here stated will apply to hospital ships. I have been told by an officer in the Royal Mail service that since they gave up swabbing between decks in the yellow-fever zone there have been remarkably few cases of fever on board their ships.

The regulations say—"in very wet weather," when the men cannot go on the upper deck, the troop deck is only to be sanded over and swept, without the use of water; and again—"The troop decks are not to be washed down in the ordinary way more frequently than may be absolutely necessary to ensure cleanliness and health, and care is to be taken that the decks when so washed are well dried before the troops are allowed to go upon them. Airing stoves will be used when necessary." The "ordinary way" of washing the troop deck is to flood it with water, and thus have a float-out of filth with the least possible labour. There is nothing in the regulations to sufficiently warn a military officer in command against this excessive use of water between decks.

**The Atmosphere between Decks.**—Moisture in the atmosphere must be regarded as a powerful agent in the production and propagation of disease. It is desirable that some standard should be fixed as to temperature and humidity. A standard condition one should endeavour to secure as that most beneficial to health is shown at p. 198.

**Disinfectants.**—A scale of disinfectants to be placed on board may be found in the Q.R., sec. xvii., para. 131, whenever troops proceed by sea. All articles for disinfecting and fumigating are supplied by the Admiralty.

**Carbolic Acid**, in the proportion of 1 lb. crystallised acid to 5 gallons of water, is a useful disinfectant. Being neither acid, alkaline, nor corrosive, it may be used without injury to paint, wood, metal, or clothes. Added freely to fetid bilge water, it is a good and safe deodorant. Chloride of zinc may also be used.

Although desirable to have the bilge in as dry and pure a state as possible, the less pumping, flushing, tampering with or

attempting to clean a bilge when troops are on board the better, especially so when in warm latitudes.

Used as an aerial disinfectant, carbolic acid, added in the same proportion—1 lb. to 5 gallons of wet sand—it can be placed in shallow vessels in various parts of a ship. *See* p. 301.

Disinfectants should only be regarded as substitutes for primary sanitary conditions. It is only when ventilation, the state of the air, and matters relating to cleanliness are at fault that disinfectants should be had recourse to. To mask or subdue the stench of hydrosulphate of ammonia, which is the effect of putrescence, is a different thing from the removal of the cause. Where disinfectants are required, bichloride of mercury—1 part to 1,000, as before stated—is most effective, and without smell. It is not included in the scale of disinfectants on board. *See* p. 278.

*Abstracts from Instructions for Masters of Transports.*

**Sanitary Precautions.**—“Prior to the embarkation of troops, the ship is to be thoroughly cleared throughout, well ventilated by properly-trimmed wind sails and such other means as are available, and by airing stores when necessary. Chloride of lime is to be freely used in the pump-wells and holds, and the timbers are to be cleared, fore and aft, for a free passage of water.

“The master is to take care that cleanliness, dryness, and proper ventilation are at all times maintained. Care is also to be taken that the ship is always pumped dry, the pump-well frequently swabbed and disinfected, and when necessary that fire is let down to dry it, due precautions being taken against accidents. The holds and the lower part of the ship are at all times to be kept perfectly clean and free from noxious smells.”

**Stores and Supplies.**—“The master will be held responsible for the care and preservation of all provisions, bedding, and other public stores placed in his charge for the use of troops, as well as for their being issued, expended, and accounted for in accordance with established regulations.”

**Loss of Stores or Supplies.**—“If any loss of provisions, bedding, or stores should occur through carelessness or neglect, or from other causes, the master is to state the circumstance in his own log-book, and to procure from the O.C. the troops a certificate, countersigned by the transport officer, stating the particulars of the loss, whether blame was attributable to anyone, and, if so, the name, rank, corps, etc., of the persons responsible for it. When bedding shall appear unfit for issue in consequence of having been used by the sick or from any cause, or when provisions, victualling stores, etc., whether shipped as cargo or for use on board, shall be found to be damaged or defective, the master is to report to the transport officer or naval authorities, and in their absence to the O.C. the troops.”

**Fresh Meat and Vegetables.**—Whenever the ship is in port, whether at home or abroad, the troops are, if possible, to be supplied with fresh meat and vegetables as directed in the established scale of rations. The master is therefore to take measures by application to a transport officer, by demanding on a Government storekeeper, if there is one at the port, or on a Government contractor, or by purchase, if necessary, for obtaining the requisite supplies from day to day."

**Provisions, including Medical Comforts.**—"The master is to satisfy himself, as far as may be practicable, that all supplies of provisions are sweet, good, and wholesome, and that all casks of porter, wine, spirits, and other fluids are sound and full at the time of being received on board. The master is frequently to communicate with the transport officer respecting the good order and preservation of the provisions, medical comforts, forage, bedding, and stores on board; and, accompanied by that officer (whenever he shall think fit) and the chief officer of the ship, is frequently to examine their condition, in order that any defects may be discovered, and as far as possible promptly remedied. All such examinations are to be recorded in the log-book.

"If, when the ship is victualled by the owners and invalids are embarked for passage, it shall be considered necessary by the military authorities that medical comforts in excess of the quantities specified in the scales of rations should be supplied for their use, the additional quantities put on board by Government for that purpose are not to be issued until the whole of those of the same species supplied by the owners have been expended. In such case the M.O. gives a certificate to the master, stating that the entire quantity of each article furnished by the owners had been previously expended, and specifying the quantity of Government stores issued to the invalids. All remains are to be returned to the Government victualling yard."

When troops are proceeding on service, for their use after landing, it is customary to ship in each transport 14 days' supply of everything in the way of provisions for all on board; further supplies and medical comforts are forwarded in store ships. The magazine stores in charge of the C.O. include two days' biscuit and preserved meat, and three days' grocery ration for use on landing.

The scale of rations, medical comforts, and disinfectants on board are detailed in the Q.R.

**Rations.**—During each week salt beef is issued on two days, salt pork on two days, and preserved meat on three days; each ration of meat is 12 ozs. 12 ozs. of biscuit is issued on three days, and 1 lb. bread on the other days; 1 oz. compressed vegetables or 2 ozs. preserved potatoes are given on each ration. Split peas are added whenever pork is issued. A proportion of



condiments, 2 ozs. salt,  $\frac{1}{8}$  pint vinegar, and 6 ozs. pickles are given as a weekly issue, and on all articles included among the scale of rations. The scale of rations is considered to be sufficiently varied for health, but in order to meet cases where it is absolutely necessary to depart from the scale, a scale of equivalents is provided which adds a few more articles to those already given on the ordinary scale. These equivalents are in the same proportion as when similar substitutes are authorised on land. In addition, a special scale is provided for women and children. It is well for the M.O. to bear this in mind in case of sickness occurring among them.

The following are some notes from the Q.R. concerning rations on board ship :—

Temperance men not receiving porter (or spirit, as a substitute) are each to be allowed, daily, 1 oz. of sugar, and a  $\frac{1}{4}$  oz. of tea, in addition to the quantities of those articles specified in the scale of rations. Those men who do not receive these additional quantities will be credited in office with a penny a-day.

Neither porter nor spirit is to be issued to prisoners or “punishment men,” except under medical advice, and with the sanction of the military C.O.

Preserved meat is to consist of beef and mutton, which are to be provided in equal quantities, and to be issued alternately.

Fresh meat and fresh vegetables are to be issued *whenever practicable*, 1 lb. fresh meat being considered equal to 1 lb. salt meat; and 8 ozs. of fresh vegetables are to be the ration for men, women, or children: but when fresh vegetables are not procurable, preserved potatoes (uncooked) 2 ozs., or compressed mixed vegetables 1 oz., are to be issued in lieu.

Fresh vegetables are to be issued, whenever procurable, with salt or preserved meat, in lieu of the flour, suet, raisins, peas, compressed vegetables, preserved potatoes or rice, specified in the scales.

Fresh meat and vegetables are also to be obtained for two days' consumption after leaving port, should the weather admit of their keeping.

In cases in which it may be impossible to provide fresh bread, biscuit is to be issued as the ration in the proportions shown in the respective scales for men, women, and children.

The scales of rations are to be regarded as generally applicable to invalids as well as to persons in health. Invalids are, however, to be provided with fresh bread every day.

In ships conveying invalids there is also to be provided a liberal proportion of live stock (oxen, sheep, and poultry, *but not pigs*), with provender and water for their subsistence. In lieu also of the regulated supply of salt meats, an equivalent in preserved meat, as well as an extra quantity of prepared soup, is to be shipped for the invalids. The extent and nature of these supplies are to be, in each case, at the discretion of the naval or

other Government authorities at the port; and they are to be replenished, as far as may be practicable, at any ports at which the ship may touch. Issues are to be made at the discretion of the surgeon.

*Rations for day of Embarkation.*—Dinners for the day on which troops embark for foreign service will always be prepared for them on board ship, unless the O.C. the corps to which they belong shall send timely notice to the O.C. at the port of embarkation that dinners will not be required on board on that day, in which case the latter officer will apprise the naval authorities at the port.

*Breakfast on Day of Landing.*—Troops under orders to land in the morning or during the forenoon of the day will be provided with a breakfast meal on board prior to disembarkation, for which no ration stoppage will be made.

**Messing Rates.**—The following are the daily rates of messing contribution and messing and ration stoppages which are due from military passengers necessarily provided with passage at the public expense, subject to exceptions according to the A.Reg.

Officers.		Officers' Families.			
	s. d.				s. d.
Classes 1 to 4 (Officers, General)	5 6	Ladies over 16 years -	-	-	5 0
Other Officers - - - -	2 0	Children 7 to 16 „	-	-	3 4
		„ 1 to 7 „	-	-	2 6
		„ under 1 year	-	-	free.

#### WARRANT OFFICERS AND SCHOOLMASTERS.

If in 2nd Class or Intermediate accommodation.						If in inferior accommodation.	
						d.	
Himself - - - - -	-	-	-	-	-	7½	Ration stoppages of Non-commissioned Officers and men.
Wife - - - - -	-	-	-	-	-	4	
Child above 2 years old	-	-	-	-	-	2	

**Mode of Payment.**—In Her Majesty's ships or troop-ships payment will be made on board before disembarkation.

For passages in contract packets, freight ships, or hired transports, the sums due will be recovered in the following manner:—

(a.) As regards the officers themselves, in the manner provided in paras. 800 to 806.

(b.) As regards the families, the amount due will be paid to and credited by the paymaster or agent by whom the necessary stoppages of the officer are accounted for.

At the termination of the voyage homeward in a packet freight ship or hired transport, the paymaster or agent from whom the officer receives his pay will credit in his public accounts the amount of messing contribution shown to be due from the officer by the messing certificate to be produced by him.

**Messing Certificate.**—Officers and others about to embark on board a packet, hired transport, or freight ship will provide themselves with the prescribed form of messing certificate (A.F. O 1669), and before they go on shore will complete the form, or cause it to be completed, in every particular, including the signature of the master of the vessel, and of the O.C. the troops, or of the officer himself where there is no C.O.

Payment on account of messing contribution will be due from the day on which the first dinner meal is provided on board to that on which the last dinner meal is provided on board, both days inclusive.

Wine or beer not being included as part of the messing provided at the public expense for officers or their families on passage, they will be required to pay on board for the actual quantities they may consume.

*2nd and 3rd Class Passengers (exclusive of Officers' Servants—except Soldier Servants).*

Ration stoppages for passages provided in any description of vessel will be credited on A.F. O 1671, in accordance with the instructions printed thereon.

**Sick Soldiers in Hospital Ships** conveying invalids, when supplied with a hospital diet, are stopped 7d. a day. *The hospital on board a transport is non-dieted.*

N.C.Os. and men are charged for groceries 1½d. a day, and 1d. for each spirit ration or its equivalent, one pint of porter.

**Medical Comforts** should be drawn from the master *daily* as required for the sick. The M.O. in charge, in the interests of the sick and in his own interest, should see that this regulation is strictly adhered to.

**Lime Juice** is included among medical comforts. In the victualling scale ½ oz. is shipped for each person for the number of days for which provisions are supplied. Lime juice is issued at the discretion of the M.O. As a rule, its issue is commenced a few days after embarkation, as soon as the men recover from sea-sickness. *See p. 252.*

The M.O. should be most particular about this issue when men are proceeding on active service. It is of the greatest importance that it be used as a prophylactic. Lime juice for field service ought not to be put up in glass bottles, as they are too easily broken. Here it may be remarked that sulphuric acid for fumigation is placed in special charge of the M.O., supplied in ½ lb. glass-stoppered bottles. It should be distinctly labelled, as before now sulphuric acid has been mistaken for lime juice. Lime juice, like vinegar, is frequently adulterated with mineral acids.

**Medical Report.**—“M.Os. embarked with troops on board a hired ship, deeming it necessary to make any statement animadverting upon the sanitary arrangements or the supplies on board, will address such report to the O.C., submitting a dupli-

cate to the P.M.O. at the port of disembarkation. Copies of any adverse remarks embodied in the usual report of sick must also be furnished to the O.C. Whenever scurvy or any infectious disease has made its appearance amongst the soldiers or their families during a voyage, the M.O. in charge, on landing, is required to make a special report of the circumstance to the military and medical authorities at the port of disembarkation."—*Q.R.*

**Troop Ships—Fire Stations.**—In case of fire the M.Os. will repair to the hospital, the senior reporting to the O.C. the troops when the sick are ready to be removed.

*Inspections of the ship* are made once a week by the captain. The executive officer, who inspects the ship daily at 10 a.m. and 8.30 p.m. at sea, is accompanied by the captain and subaltern of the day, and also at his evening rounds by the M.O. on duty and by the paymaster. The latter reports to him all the cabin lights for the use of the sick, for which he has obtained the captain's sanction. The executive officer, on his rounds, visits the cells, the captain of the day ascertaining from the military prisoners if they have any complaints.

**Insanes.**—The following number of insanes, which may be brought home in one of H.M.'s ships, will serve as a guide for smaller ships with less accommodation:—For this purpose insanes are divided into two classes, viz: 1. Requiring watching, "harmless;" 2. Violent, troublesome, or mischievous. In a troop-ship chiefly conveying troops in health, not more than 8 of the first class and 4 of the second class are to be accommodated; in a troop-ship conveying chiefly invalids, only five of the first class and three of the second.

Total numbers not to exceed 12 and 8 respectively on board ships carrying troops or invalids; in addition two insane officers may be embarked if suitable accommodation and attendance can be given.

Before any insane persons embark the captain is to receive from the authorities making the requisition a confidential report.

All military insanes will be in the charge of the military M.O., naval and civil insanes in charge of the naval M.O.

In the case of violent insanes, the captain should appropriate one or more cells at his discretion, which should be padded if necessary, but in no other way marked as set apart for the purpose.

A part of one of the latrines should be separated for the use of the insanes, and if there is a port in that part it should be barred, so as to prevent the possibility of anyone getting through.

Whenever it is necessary in the opinion of the M.O. to direct the use of handcuffs or a strait-waistcoat on any particular patient, it is to be reported through the usual channel to the captain; and when it is desirable for men so restrained to be



brought on deck for airing, additional precautions are to be adopted to prevent the possibility of their getting overboard.

All insanes, whether harmless or otherwise, should have soldiers or attendants specially detailed for their case; and on no account is any escort over them when on deck for airing to wear sidearms. The part of the deck where they take their exercise is to be kept clear for that purpose, and only so many as the escort is well capable of taking charge of should be brought up at a time.

Great care is to be taken that all arms are removed from the vicinity of the place where the insanes are berthed.

Care should be taken that insane persons are not made acquainted with the nature of confidential reports, and their names are to be entered on a separate embarkation sheet.

**Epidemic Diseases.**—In the event of small-pox, yellow fever, or any of this class of specific disease occurring on board, the principles of isolation, or separation of the sick from the healthy, should be applied, and disinfection practised as far as possible. A hospital may be established on the *upper deck*, on the *fore part*, but this position will not answer between decks.

A ship in motion is said to cleave the air as she does the ocean, and thus causes an outward current from her bows; perhaps it is so theoretically, but it is a principle in the construction of ships to keep out water and let in air, so that the air may pass along between decks; thus the two elements are differently treated.

A single case of an infectious disease might be provided for in one of the ship's boats, over the side, under an awning.

**Landing of Troops and Stores.**—"The following regulations are to be observed (during peace):—All troops, with their baggage, regimental stores and horses, are to be shipped and landed by the Navy; all stores at the various ports at home or abroad to be lightered to and from the ships by the Army, which does all the work not provided for by the crew.

"During war, at the base of operations, the arrangements as to troops to be the same as during peace as regards stores; boats, lighters, and tugs must be in port, and should, if possible, entirely be provided and worked by the Navy. If the stores be taken to or from a beach, the work of landing and shipping should also devolve on the Navy up to high-water mark. Wharves and piers being maintained by the Army, and in Army charge, the labour of landing and shipping alongside of them should devolve on the Army, the Navy being responsible for the shipping and stowage of the craft (all work on board ship being naval), and the fullest assistance being given in hoisting by the military if troops are on board."—*Q.R. and Admiralty Instructions*.

If a corps of stevedores were established, much saving might be effected at the landing stages at the base of operations.

## CHAPTER XII.

## FIELD SERVICE, MARCHES, ENCAMPMENTS, BIVOUACS, ETC.,

WAR, apart from all its pride and pomp and glorious circumstances, is classified among those evils from which we pray to be relieved. Guthrie aptly described war as "an epidemic of injuries." But no matter what the epidemic may be, or the nature of the evils thereunto belonging, the position of the M.O. is always the same, for wherever the epidemic is, there his first duty lies; he is as one standing between the living and the dead; thus his is the post of the greatest danger. The time spent in a cholera camp in the East Indies, or while engaged in combating an attack of yellow fever in the West Indies, are military services fraught with as much danger, and call forth as good manly qualities as any rendered during a campaign. Although such services do not, and perhaps rightly, come within the recognised standard of military proficiency, they have frequently elicited the approbation of those in command.

There are scourges accompanying war which are far more destructive than the operations of the enemy; and it is in guarding against these hidden foes, operating within an army, that its medical services are primarily concerned. In order to prevent disease or restore health, and mitigate human suffering, it is necessary that a M.O. should be acquainted with the means by which epidemics are caused, and the laws or rules by which their progress is governed; in the case of disease it is nature's laws that are operating. In the prosecution of war, strategy and tactics supply the rules which control or regulate its epidemics of injuries.

**Strategy** in the science and art of war is that part which refers to the disposition of the forces, and their movements in the whole theatre of war, and the art of bringing the forces of an army to bear upon an important point within the zone of operations; "to fight the enemy in detail with all your concentrated strength is the first great object at which strategy aims."

Colonel Maurice says—"The new 'implements' of strategy are railways, electric telegraphs, and telephones, steam-ships of all kinds and sizes, canals, improved and macadamised roads, all improved modes of conveyance, such as bicycles, tricycles, etc.; lastly, compressed food."

**Tactics**, on the other hand, is the art of manœuvring in the presence of an enemy when men arrive on the ground at the point of contact. Tactics as an art is practised in the actual

encounter, and like other arts it requires practice for efficiency ; it cannot be learnt upon paper ; it is the essence of the art of war, the basis and foundation of tactical army organization.

So much depends upon the feelings and disposition of the troops and on unforeseen events ; war cannot be regarded as an exact science like the physical sciences, which admit of demonstration ; here too many considerations connected with unknown quantities are involved to lay down any fixed laws by which to frame the rules of the art. Dealing with matters of only probable and uncertain value, there is much room left for conjecture, doubt, and speculation ; so the principles upon which the rules depend are "common sense." Feelings and sentiments are the mainspring of *esprit de corps*, and operate as a vast power within an army. More than this, they rule the world and formulate its laws, set armies in motion, and justify wars.

A regiment that fancies it cannot be beaten is hard to beat. Prejudices, although undesirable in persons who administer justice, or who have to exercise their judgment in the administration of affairs, may be due to the most noble instincts, feelings, and sentiments. The essence of *esprit de corps* is prejudice ; born of affection and sympathy it is fostered by associations, surroundings, and traditions. A regiment without traditions is almost without *esprit de corps* ; sometimes it manifests itself as a sentiment identified with a number, a badge, or a button, but the power and utility of it should not be overlooked, as it tends to establish a disposition towards the observance of good order and military discipline, and acts within a regiment as a firm bond of mutual help and unity of purpose.

**Strategical Points.**—In campaigns there are at least three strategical points of the greatest importance. 1st. *The base of operations*, which is the place from which the field operations commence ; here the army collects its magazines, stores, and provisions, and is the depôt for recruits, reinforcements, and its supplies ; here also men sent back from the front on account of disabilities are treated in hospital, to be returned to the ranks or invalided. In most of our recent wars the bases of operations have been the landing-place of the expeditionary force. 2nd. *The objective point* ; that is, the position to be attained is determined by the object of the undertaking ; the direction taken by an army to reach its object is termed the *line of operations*. 3rd. *The line of communications* is intermediate between the other two points ; it is the route by which the portion of the army in front receive their stores and supplies, and by which they return their sick and wounded to the base. See p. 412.

The organization and disposition of a field force must be arranged in connection with these three strategical points. Irrespective of divisional commanders, a general or other officer is appointed to the special duties appertaining to the base of operations and line of communication, and to these positions

also are appointed administrative M.Os. to direct and carry out the instructions laid down by regulation relative to the duties of the medical services.

Our war hospital system is organized in relation to these three principal points.

The protection of sick and wounded in war is a military duty for which the general or other C.O. is responsible; however, in defending the wounded the Victoria Cross has frequently been won by M.Os.

Wellington used to say—"That the power of the greatest armies depends upon what the individual soldier is capable of bearing and doing."

This is a question primarily of physical fitness; and when associated with drill, discipline, and armament, it becomes the basis upon which all principles of strategy and tactics are framed; and, as before stated, it is also the foundation of military organization and administration.

The primary object sought is to render the soldier formidable as a fighting machine, to increase to the utmost his power of execution; this embraces his whole personality, and cannot be considered apart from the sustenance of his powers and the conservation of his energies. The physical condition and mode of armament of the soldier will follow in the wake of science, and his wants will increase and multiply with the advancement of civilization.

"The trade of the soldier is war. For war he is selected, maintained, and taught. As a force at the command of a government, the army is also an agent for maintaining public order; but this is a minor object, and only occasionally called for, when the civil power is incompetent.

"In theory, an army should be so trained for war as to be ready to take the field at literally a moment's notice. The various parts composing it should be so organized that, almost as quickly as the telegram flies, they can be brought together at any point, prompt to commence those combined actions by which a body of men are moved, fed, clothed, kept supplied with munitions of war, maintained in health, or cured if sick, and ready to undertake all the engineering, mechanical, and strategical and tactical movements which constitute the art of war.

"That an organization so perfect shall be carried out, it is necessary that all its parts shall be equally efficient; if one fails, the whole machine breaks down. The strength of a chain is the strength of its weakest link, and this may be said with equal truth of an army. Commissariat, transport, medical, and engineering appliances are as essential as the arts of tactics and strategy. It is a narrow and a dangerous view which sees in war merely the movements of the soldier, without recognising the less-seen agencies which ensure that the soldier shall be armed, fed, clothed, healthy, and vigorous.



"During peace the soldier is trained for war. What is meant by training for war? Not merely that the soldier shall be taught to use his weapons with effect, and to act his part in that machine where something of mechanical accuracy is imprinted on human beings, but that he shall also know how to meet and individually cope with the various conditions of war, which differ so much from those of peace."—*Parkes*.

Although the British soldier at home does not receive as much special training as might be desired, still of recent years, since this was first written, great advancement has been made in his instruction in flying columns, and at autumn manœuvres, and all that appertains to life in camp while abroad in the colonies; in India especially he has the advantages of a vast and varied field, which accustoms him to marching and camp life; again, in war, the true school for acquiring proficiency in his art, much opportunity has been given him of recent years; since 1882 especially advantage has been taken of experiences gained in this way, with the result of a marked improvement and increased efficiency in all arms and services.

It is during peace that the guiding principles of organization and the foundations of all military system should be established. It is almost impossible to commence framing any system of organization when war is declared, and modifying or maturing it during a campaign.

At present more depends on preparation and less on chance or individual genius than was the case formerly. To meet emergencies, self-reliance and readiness of resources are excellent qualities possessed by men of special ability, but they may prove to be of but little utility beyond temporary makeshifts unless based on principles of organization and executed with system, for no matter how self-reliant and confident a man may be before setting about a thing, it is necessary to know what can be done and how it should be done. To do a thing correctly your plans must be matured upon a sound basis, the ultimate as well as immediate effects of an action must be borne in mind. An organization may be disjointed and confused by a haphazard system of field administration.

**Field Administration.**—With regard to the qualities necessary for the commander of an army, Colonel Soddy in his "Lessons of War" says—"He must be a man of high moral and physical courage. He has no need to be a man of great scientific or military acquirements or erudition. His knowledge may be limited, but it should be thorough, and he should be perfectly grounded in the principles at the base of the art of war.

"Next in importance come the qualities of his personal character. A man who is gallant, just, firm, upright, capable of esteeming merit in others instead of being jealous of it, and skilful in making this merit conduce to his own glory, will always be a good general, and may even pass for a great man.

Unfortunately, the disposition to do justice to merit in others is not the most common quality; mediocre minds are always jealous, and inclined to surround themselves with persons of little ability, fearing the reputation of being led, and not realizing that the nominal commander of an army always receives almost all the glory of its success even when least entitled to it."

There is an important point not mentioned, although perhaps implied in this qualification of efficiency, namely, that the general officer selected for command of an army in the field should be physically fit. Above all things courage is essential in a soldier, but to a general judgment is most requisite. The same quality and conditions of mind and body, with a practical knowledge of the special duties connected with the position, is required in the case of the P.M.O. of the force.

The principles of justice are the principles of sound administration and military command. Every man is entitled to get justice, and it is the duty of those placed in a position of trust and authority, not alone to administer justice, but to see that it is done, exercising their own judgment without partiality, favour, or affection. It is well to bear in mind that when doing one individual a good turn, or stretching a point for him, you may at the same time be doing an equally worthy person a bad turn and an injustice. St. James states being without partiality as one of the attributes of moral virtues connected with Divine wisdom.

**Central Administration, Medical Service.**—Whenever the sending abroad of an expeditionary force is decided upon, the Director-General of the Army Medical Department advises on subjects appertaining to the health of the army, and arranges under central administration matters relating to medical and surgical stores, supplies, equipment, ambulance, and all medical services, to accompany the army and provide for the care and comfort of its sick and wounded. He has the nomination of the personnel of the Medical Staff to different posts and hospitals. The higher the appointment the greater are the interests involved. A so-called cool head—that is, one capable of receiving correct impressions, and of estimating events or objects at their real value—is necessary for field administration. There is no more absolute power among officers than that placed in the hands of the P.M.O. of a field force over the Medical Staff. Perhaps there is no better test of character than the way a man uses power. Altogether the selection of these officers is a very important, onerous, and responsible duty. Theoretically one officer is as competent as another, but practically this is not so.

Before an army takes the field, the D.G., in addition to the information and advice usually tendered to the War Department on matters connected with the hospital arrangements of the army, will, on the requirement of the Officer Commanding-in-Chief, give his opinion in writing on all matters connected with

the country, climate, productions, rations, clothing, shelter, sanitary arrangements, and precautions, and on all other matters bearing on the health of the troops.

The D.G. will issue to the P.M.O. of every army on active service such a code of instructions for his guidance on all matters connected with the above as he may see necessary to meet the specialities of each case.—*M.R.*

The well-being, physical fitness, and efficiency of a modern army are intimately associated with medical science, and the provisions made by reason of this in matters of hygiene are becoming duly recognised, while the demand for a thorough care of those disabled in war is a development of recent origin. This is in accordance with the progress of the age; and the more public opinion becomes enlightened, so much the more will the association of the medical services of the army be recognised, strengthened, and confirmed, rendering the task of central medical administration probably none the less difficult on account of these necessarily extended services, while the position of the P.M.O. in the field and his staff is one of increasing responsibility and trust.

General Brackenbury says, in his notes on the "River Column"—"The chief care of a general in the organization of a force for active service is to ensure to his troops a sufficient supply of food and ammunition. This requires a sufficiency of transport, which again requires food for the transport animals. It may be assumed as a general rule that troops start properly clothed and armed, so that a supply of clothing and arms is only required where an expedition is likely to be prolonged.

"When a general has secured for his troops the reasonable certainty of the necessary food and ammunition, he is at liberty to turn his mind to other questions of organization, foremost in importance among which is the care of his sick and wounded, and in all ordinary expeditions the evacuation of the sick and wounded from his field hospitals to hospitals upon the line of communication. It may safely be said that these questions require far more time and elaboration of detail than the strategical and tactical questions. And the system now prevailing in all European armies is to give to a general in command of an expedition a chief of the staff, who relieves him of this detail and of all the minor details of camp routine, leaving the general in command free to weigh the value of the reports made by his intelligence department, and to decide by what means, strategical and tactical, he can obtain the greatest advantage over his enemy. This system ensures to the general in command time for thought, relief from small worrying cares, and leisure to mature his plans of campaign and of battle.

Referring to the necessity of communication between military and medical officers, Inspector-General A. Gordon, M.D., remarks—"It would be well were the military and medical



authorities of forces employed in expeditions aware of the great benefits that arise from free communication between them, and the great evils—even extending to the serious embarrassment of the operations—that follow a contrary course.

“Military officers in charge of brigades and divisions do not on all occasions inform their P.M.Os. of the intended operations of the force. The natural result is that medical arrangements are in such a case not made to suit the newly-created circumstances of the force, and inconvenience, more or less, soon follows. Nor is this all; instances upon instances could easily be mentioned where a severe reprimand has appeared in orders to the M.O. for an omission for which the commander was solely and alone responsible.”

However, it is most readily conceded that there are many exceptions to this. For instance, the intimate relations that existed between Lord Wellington and Sir James McGregor, and between Sir Edward Layard and Dr. Gordon during the operations against the Indian rebels in 1858, to which may be added those which are well known to have existed between Napoleon and Baron Larrey.

The condition of troops on service may be included with sufficient completeness under the four following heads:—1, on the march; 2, on fatigue; 3, fighting; 4, at rest.

**Marching.**—The relation which exists between the physical forces and food has already been stated in the chapter on food; it is a subject intimately connected with the one to which we are now about to refer.

The Rev. Professor Haughton, M.D., of Dublin, “has shown that walking on a level surface at the rate of about three miles an hour is equivalent to raising  $\frac{1}{20}$ th part of the weight of the body through the distance walked; an easy calculation changes this into the weight raised one foot. When ascending a height a man of course raises his whole weight through the height ascended.

“If a man of 150 lbs. weight walks one mile at the above rate, the work done in tons lifted one foot will be 17·69; double this for two miles, and so on. If a man carries 60 lbs.—the weight accredited to the British soldier when marching—one mile, the work done will be equal to 24·75 tons lifted one foot; and as in the other case add these figures for each mile walked; thus the work performed by marching in this way 10 miles equals 247·5, and this must be considered as a moderate day’s work; while a forced march of 20 miles, carrying 60 lbs., equalling 495 foot-tons is a heavy day’s work. “As a continued labouring effort, Dr. Haughton believes that walking 20 miles a day without a load (Sunday being rest), is good work (353 tons lifted a foot); so that the load of 60 lbs. additional would make the work too hard for a continuance.” Far more labour than this is frequently exacted



from soldiers, and during our short campaigns everything is taken out of them, with a result which can only be regarded as a great waste of material. The formula given for calculating walking at the rate of three miles an hour is  $\frac{(W + W') \times D}{20 \times 2240}$

where W is the weight of the person, W' the weight carried, D the distance walked in feet, 20 the co-efficient of traction, and 2,240 the number of pounds in a ton. The result is the number of tons raised one foot. To get the distance in feet, multiply 5,280 by the number of miles walked; or again—

$$150 + 60 = 210 \times 5,280 = 1,108,800$$

$$20 \times 2,240 = 44,800, \text{ which divided into } 1,108,800 = 24.75.$$

Haughton also gives the “co-efficient of resistances” for calculating different velocities. He states the “law of fatigue” as follows:—“When the same muscle (or group of muscles) is kept in constant action till fatigue sets in, the total work done multiplied by the rate of work is constant.”

It is not proposed that soldiers should always be marched at three miles an hour, but it is the rate at which most work can be done with the greatest conservation of energy; an increased expenditure of energy will tend more rapidly towards fatigue and exhaustion of his physical powers. This subject is one of very great importance for those who march men and use them; they ought to have some conception of the conservation of the energy placed at their disposal. Marching is far more trying work than getting over the ground like an ordinary pedestrian. The value of scientific computations is undoubtedly diminished in the case of the soldier on service, when the distance marched must be measured in connection with the difficulties encountered by the way, the state of the weather, the proximity of the enemy, and the previous strain or want of training to which the men have recently been subjected. Furthermore, the numerical strength and composition of a force will materially influence its marching powers.

A division marching at an ordinary distance and rate will accomplish from 12 to 16 miles a day at from 2 to  $2\frac{1}{2}$  miles an hour, including halts, and this can be continued up to six days in a week. For every 100 miles marched it is reckoned the force will lose from two to three per cent. of its strength, according to circumstances (*Wolseley*). This percentage of loss seems rather low; in India when corps are marching from one station to another in the ordinary course of relief, five per cent. of dooley carriage accompanies them. However, it is after a march or prolonged muscular effort that men for the most part fall sick.

“It is a generally admitted principle that for a complete rest after a sustained effort—such as a long march—at least 12 hours in 24 are necessary for both man and horse. Deducting from the remainder an interval of 3 or 4 hours for preparation for the

march and for duties at the close, from  $1\frac{1}{2}$  to 3 hours for halts on the march itself, there will ordinarily remain for actual marching an interval of 5 to  $7\frac{1}{2}$  hours in the 24.

"Infantry, with a good road and favourable weather, can accomplish in these circumstances  $2\frac{3}{4}$  miles an hour; cavalry and horse artillery, 5 miles; field artillery and train, 3 miles. Consequently, in the interval (5 to  $7\frac{1}{2}$  hours) the length of the actual march would be  $13\frac{1}{2}$  to  $20\frac{1}{2}$  miles for infantry, 25 to 35 miles for cavalry and horse artillery, 15 to 22 miles for field artillery and train.

"These rates decrease as numbers increase; so that practically, in divisions, for instance, infantry cannot accomplish more than  $2\frac{1}{4}$  to  $2\frac{1}{2}$  miles, and in army corps not more than two miles per hour.

"If the movement continues for several days, it is necessary to halt for a whole day at intervals, in order to recruit the strength of the men and horses, and more particularly to repair material. The number of halts, therefore, will depend on the condition of the troops and the state of the material."—*Major F. U. H. Clarke, R.A., "Lectures on Staff Duties."*

"**Forced Marches** should be avoided as much as possible, for they fill your hospitals with sick. At times they are of course necessary, but when made to excess, they are ruinous to military efficiency. The wants and comfort of the individual soldier should never be forgotten by the S.O. when framing orders for a march, although the exigencies of war may necessitate their being purposely ignored for the time during some particular operation. Above all things, endeavour to spare your men and horses all unnecessary fatigue, for the less you take out of them the greater will be their powers of endurance when in any emergency you have to call upon them for extraordinary exertion."—*General Lord Wolseley.*

There is no better example on record of the skilful conservation of the physical powers of his men than was displayed by General Sir F. Roberts in his march from Cabul to Candahar. He traversed a distance of 232 miles in 15 days; average, including halts,  $15\frac{1}{2}$  miles a day. His longest marches in any one day were 20 and 21 miles. At the end of this march he brought in his men fresh and fought a decisive battle.

The timely and judicious selection of camp grounds and supplies, and the maintenance of good order and sanitary precautions during a march, are among the most important means of sparing the troops from unnecessary fatigue.

Before going into action, care should be taken that the men receive some food. An army is said to "fight on its belly," and this is a very pertinent remark. Although men are taught to take every advantage of cover in their approaches, still it is not intended that, serpent like, the soldier should advance to meet the foe, but rather that the inner man should be replenished before

an engagement. The shock from an injury is not so much felt after a meal has been digested, and a man will then also be better prepared to suffer a loss of blood, or endure the strain of battle and pursuit.

What is here stated from the Regulations and Instructions for Encampments, 1888, should be known to officers commanding bearer companies and field hospitals, as well as other officers. A knowledge of these "Instructions" is so very necessary for all M.Os. in camps or on field service, that I am induced to quote from them rather extensively. The basis on which they are framed is the report of the Commission, 1861, before referred to. The whole subject of encampments has special reference to sanitary science, and in conjunction with it and the laws by which it is governed all arrangements should be made; although the site for a temporary camp is chosen on account of some tactical advantages, and the allotment of the ground within it to the different units, and the disposition of the forces generally are military questions, yet, no matter what the plan of a campaign may be, or whatever arm of the service be taken, the sanitary principles of camp formation and interior economy will remain the same in all climates and under all circumstances. The recently-issued regulations on the subject (1888) are chiefly a re-arrangement of the different units within themselves in a more convenient manner, necessary on account of their present field organization, but the relative position of the different arms has not been changed.

**Camps.**—Camps may be formed of huts or of tents, or they may be mere bivouacs made of brushwood, straw, branches of trees, or anything soldiers can find ready to hand.

Hut encampments are chiefly used when an army occupies a defensive position for a long time or during a siege.

Of whatever materials a camp may be formed, it is evident that its position and form must, to a great extent, be governed by either strategical or tactical reasons.

**The Selection of a Site.**—The site for a "standing" camp is selected chiefly because it presents certain strategical advantages. The site for a temporary camp is chosen on account of some tactical advantage the ground may offer.

Troops in the field should be encamped in such a manner that they can be rapidly formed in a good position for action. This does not involve the necessity of encamping on the very position itself. On the contrary, it is preferable to encamp under cover in rear of, but so near to the position that it can be quickly occupied. It is most desirable that such a position should be selected as can neither be commanded nor turned. Such a happy combination of circumstances cannot, however, always be found. Before an enemy, purely strategical and tactical considerations are of the first importance, but in determining between two sites,

in which these may be equal or nearly so, it should be remembered that the comfort of the troops in reference to the nature of the ground they have to lie on, should, in conjunction with sanitary conditions, be the next consideration; if men are on very rough, steep, damp, or stony ground, their rest, and therefore their health and efficiency, will suffer.

**Sanitary Principles of Camp Arrangement and Construction.**—The two most obvious and important principles to be kept in view in forming a camp are:—

1. To select the best ground obtainable, and at the greatest distance from all sources of malaria.
2. To adopt suitable sanitary precautions in constructing and arranging the accommodation.

*Selection of Site.*—The worst ground for a camp is clay soil, or a clay subsoil coming near the surface. Such sites should always if possible be avoided. They are retentive of water, and keep the atmosphere over them damp or in a malarial condition. A few trial holes dug at different points of the ground will show whether the subsoil is dry or otherwise. Ground immediately at the foot of a slope is apt to be damp and unhealthy, on account of receiving water from the higher levels. Ground of this nature occupying the angle between hill ranges and the lower flat country, or situated in deep narrow valleys, often predisposes its occupants, even in temperate climates, to epidemic diseases. In tropical climates these angles and gorges are often covered with dense unhealthy vegetation. High positions exposed to winds blowing over low marshy ground, miles away, are in certain climates unsafe, on account of fevers. Indeed it sometimes happens that the immediate vicinity of a marsh, or other local cause of disease, is safer than an elevated and distant position to leeward. For a similar reason, elevated sites situated on the margin or at the head of steep ravines, up which malaria may be carried by air currents flowing upwards from the low country, are apt to become unhealthy at particular seasons. Such ravines, moreover, from want of care, are often made receptacles for decaying matter and filth, and become dangerous nuisances. There is reason to believe that in tropical climates these ravines convey malaria, and occasion aggravated remittent, or even yellow fevers, at an elevation which would be otherwise exempt from the action of tropical malaria. In tropical climates, camping grounds at the mouth of narrow wooded valleys, down which wind blows, often predispose to fever, and should be avoided.

Ground covered with rank vegetation, especially in tropical climates, is unhealthy, partly on account of the amount of decaying matter in the soil, partly because the presence of such vegetation is in itself a mark of the presence of subsoil water, or of a humid atmosphere. In warm climates, muddy sea beaches or river banks, or muddy ground generally, if it be subject to



periodical flooding, and marsh land, especially if it be partly covered with mixed salt and fresh water, are peculiarly hazardous to health.

A porous subsoil, not encumbered with vegetation, with a good fall for drainage, not receiving and retaining the water from any higher ground, and the prevailing winds blowing over no marshy or unwholesome ground, will, as a general rule, afford the greatest amount of protection from disease which the climate admits of.—*Commission Report*, 1861.

It is presumed in selecting a site no one with an atom of sense in his head would camp his men in a graveyard, yet it is always mentioned as a place to be avoided. The immediate vicinity of slaughter-houses are not desirable localities; churches are generally damp and unhealthy buildings for troops, neither should they be occupied as hospitals.

As well as a knowledge gained by a medical survey of the topography of a district, the salubrity of a site for permanent occupation may be tested by habitation, and the observation of the general health of the residents of the locality and nature of the diseases to which they are subject.

The test by habitation of a site is a slow process, and so much can now be done to improve a position that its value in relation to camp grounds is not considerable.

The robustness of the inhabitants is sometimes stated to be an indication of the healthiness of a district through which troops are to march. Be it observed troops are not inhabitants, but probably foreigners of a different race, whose habits of body and mode of life engender susceptibilities which differ materially from those of the inhabitants. The inhabitants may be well nourished upon water and food totally unfit for the sustenance of their invaders. The appearance of the inhabitants should not be taken as a criterion of the quality of the water; of course, where the people are civilised, healthy, and well to do, it is expected more suitable shelter, comfort, and food can be obtained for the troops than would be the case where the people are barbarous, though healthy. Again, the inhabitants may be robust, strong, and vigorous, and still have enough contagious fevers on hand wherewith to decimate an army coming among them; furthermore, an army can pass with impunity through a country in which there are an abundance of cretins, congenital imbeciles, and cripples, without endangering its health.

**Sanitation.**—According to the last published establishments of an army corps (Nov. 1888) there is no sanitary officer borne on the strength of the corps or its divisions; still it by no means follows that sanitary considerations are in future to be disregarded in the selection of sites for encampments, or in the selection of buildings for occupation in towns or villages. Sanitary measures will obviously be more difficult when an army is passing through towns and villages than when encamped in an open country,

where probably little scientific skill is required beyond following the regulations connected with the subject, the employment of ordinary precautions and common sense ; yet it is passing strange how indifferent, almost oblivious, many people are of the first principles of sanitation, as shown by their actions. M.Os. are not unaccustomed to meet with instances of this description.

Habitations on the continent are half a century behind England in sanitation. Should the system of billeting in towns and villages be adopted to any considerable extent in our future wars, and it is not improbable it may again be resorted to, so much the more will the presence of a sanitary officer be necessary with the vanguard of an army.

The dearly-learnt lessons of the Crimean war, of which, among other things, the sanitary officer was the production, seems to have closed the pre-sanitary age of our army. The enlightenment of public opinion has too far advanced to admit of any retrograde movement in sanitation which would be likely to jeopardise the health of our troops. Every county council or parochial and local government board in England will soon have a sanitary officer qualified in State medicine—an expert skilled in the science of how to prevent disease—to whom reference can be made with respect to public health. This as a means of obtaining reliable information is now in advance of army organization. Surely it is a more rational and consistent plan than that of asking the opinion hap-hazard of the nearest practitioner, or acting without advice ; yet this latter course is not improbably what will appertain in the army until the atmosphere is again cleared by the waste to follow on some future war. The sanitary officer of an army, one would fancy, might be regarded as if he were the representative of a board of health.

The plan heretofore adopted of a sanitary officer accompanying the staff officer who selected a site for an encampment was a practical one. Although assuming both as experts regarded the position from different points of view, yet the opinion of a specially selected sanitary officer should be weighed in the council when a selection is to be made, and prevent the consideration of sanitary matters being excluded from the essentially military aspect of the case. Experts, like enthusiasts, are at all times liable to be unduly prejudiced in favour of their own special calling. So it seemed to be a wise precautionary measure where vast interests are involved to neutralise this tendency.

War, by reason of the concentration of troops or surface overcrowding necessarily connected with its operations, is opposed to the first principles of sanitation. Pollution of the soil, both by reason of surface fouling and subsoil contamination, and of the air by exhalations from men and animals, as well as the emanation of gases from the ground, are the chief factors operating against health in camps, and are intimately connected with insufficient space as a primary cause. It is this which robs camp

life of its otherwise healthy and invigorating conditions. The longer an army remains in the presence of an enemy, or proportionally as strategical considerations outweigh sanitary considerations, so much the more will it suffer in loss of health and efficiency; there is no escape from this as a natural consequence. Attention should be judiciously directed to the ultimate effects of thus disregarding sanitary laws; to do so in anticipation of the consequences is the duty of the M.O., who is the responsible adviser of a general.

M.Os. have a right and a duty to perform in tendering advice on sanitary matters; neither should they withhold advice or warp their judgment to suit the views of the military element in power. It is for the general to act as he thinks fit under all circumstances. It is the province of sanitary science, when subservient to military authority, to advise on all matters relating to health, and to suggest all practical means for its preservation and for the mitigation of those evils which are sure to follow on a departure from the observances of sanitary laws; but to make your suggestions practical and acceptable, tact, judgment, and experience of field service are required, as well as a clear conception of the nature of the undertaking in which the army is engaged.

Manifestly a sanitary officer who would recommend the carrying out of an extensive drainage scheme in grounds in temporary occupation by the troops, the distillation of all water used during a campaign, or the carriage of petroleum with an army as a means whereby to burn excreta or cremate the dead, is not likely to find favour in military circles. A military sanitary officer should be a man with so-called military instincts. Parochial sanitation is unsuited to field service. Within an army civil and military instincts, or such acquired idiosyncrasies, are more or less at variance. If M.Os. were more military, friction would be avoided.

**Water.**—After the general features of the ground and position, the next points to consider are the facilities which the site selected affords for obtaining water, wood, forage, and straw, which are here stated in their relative degree of importance. The importance of a water supply is well known. It was on account of the absence of water in a more favourable position that the Duke of Wellington was compelled to occupy the ground on which his army was encamped prior to the action at Vimiera, in a manner which had to be altered almost at the moment of the French attack. The presence or absence of water will dictate the length of marches over a country, and the fixing of halting stages or rest camps.

A sanitary survey of water from the source to the point of supply is of great importance; it should be carried out on the spot by a competent M.O. This and all other examination by the senses are primary, to which chemical tests and the use of

the microscope are secondary and complementary. Bad water may engender a habit of the body predisposing to scurvy and kindred disabilities. Water should be obtained from as pure a source as possible, and in sufficient quantity for the requirements of the force; it should be carefully protected from pollution, and if in any way contaminated, purified. Although it is desirable in the majority of cases that means be adopted for its purification, still these must be regarded as merely accessory to the primary consideration. An insufficient quantity of pure water is better than an abundant supply of bad water; thus quality should take precedence of quantity.

Water from springs away from and at a higher level than the camping ground is best. River and lake water, if otherwise pure, ranks next, and then deep well water. Shallow wells within a camp are dangerous. Marsh water, although its physical characters may be good, should be avoided.

**Water Supply in Camp.**—Permanence of supply of spring or stream in case of encampment, chiefly noted from Parkes' "Hygiene."

If evidence cannot be got of the amount of rainfall, it is almost impossible to arrive at a safe conclusion.

The country which forms the gathering ground of the spring or river ought to be considered as to its physical features. Springs towards the foot of hills will probably be permanent. In a flat country the permanency is doubtful, unless there is evidence from the temperature of the spring that the water comes from some depth. In sandstone districts the springs are often fed from large reservoirs caused by the action of water charged with carbonic acid gradually absorbing the rock. Such springs are permanent. In chalk districts there are few springs or streams, on account of the porosity of the soil, unless the spring is at a point below the level of the surrounding country. Of the sandstone formations, new and old, the same may be said, but deep wells in this formation often yield largely, as permeable rocks form a vast reservoir. In granite and trap districts, small streams are liable to great varieties unless fed from lakes, when they are permanent.

In round numbers one inch of rainfall represents 100 tons per acre. Two or three inches of rain in 24 hours would be regarded as very heavy rain in England, where the annual rainfall is 25 inches. When rain falls it evaporates, runs off, or sinks in, from 20 to 90 per cent., according to the nature of the soil. Magnesian limestone is the least retentive soil, loose sandstone the most. Water in the soil absorbs a quantity of carbonic acid from the air in its interstices which contains 250 times as much as the atmospheric air. It then dissolves almost every thing with which it comes in contact, chiefly calcium carbonates and silicates.



The cost of labour in transporting water may be very great. To accompany the force which went to Hasheen during the military operations at Suakin, 13,000 gallons of water were loaded on 700 camels.

Water may be distributed in camp by means of pipes or india-rubber tubings, thus saving labour and avoiding risk of contamination in conveyance and stowage. It might also be economical, and prevent slopping about the camp.

Although desirable that one should have a stock notion at starting of the manner of converting barrels, oil cans, or tins of different sorts into filters, etc., and of improvising and turning to account all manner of contrivances to suit various purposes, nevertheless, if the training of the soldier should be such as to impress him with the necessity for the observance of sanitation and the use of clean water, this necessity, which is said to be "the mother of invention," will do more to attain the object than anything else. Where the mind is strongly impressed with a desire, the intellect will suggest the means. On the other hand, anything which tends to discredit sanitation among troops should be carefully avoided.

**Pumps.**—There are three kinds of pumps generally used for military purposes.

1. "A small hand, lift-and-force pump, with flexible hose. This will draw water from 18 ft., and throw it about 16 ft., working with a lift of 18 ft. and a throw of 7 ft. (the height of an ordinary water-cart). It will yield 7 gallons per minute." A water-cart holds 108 gallons.

2. "The Norton tube well consists of tubes driven into the ground with a monkey, and with a pump screwed on to the top. One of these wells takes about three hours to fix; it will yield about 7 gallons per minute. These pumps are very useful in searching for water.

3. "The 'Bastier pump' is a pump with an endless chain working over a wheel. It yields, from a depth of 25 ft. (worked by two men), 2,200 gallons per hour.

"If the water supplied is from wells, troughs must be provided for the animals to drink out of. They may be made by simply excavating the ground and roughly paving it with stones; or they may be made of wood or sheet-iron, if it can be procured."

An abundance of green vegetation often indicates a damp and unhealthy locality; but, in the event of water being scarce, by boring in such a spot probably some water will be obtained. Of course it should be drawn from as low a stratum as possible.

**Classification.**—Water has been classified:—1. Pure and wholesome; 2. Usable; 3. Suspicious; 4. Impure.

The best waters come from granite districts. Water from chalk is good, so is that from limestone and magnesian limestone. There are very few springs in clay soil; most of the

water runs off. The water is chiefly surface. Alluvial soils always supply suspicious water. Surface and subsoil waters are dangerous.

Shallow well water is suspicious, and easily contaminated by the surroundings of camp life; heavy rains will wash many substances into it. Any well which does not pass through a stratum of impervious clay or hard rock must be classed as a shallow well, or a well of less than 50 ft. deep. Although palatable, such water is dangerous.

Artesian well water, marsh water, loose sand and gravel waters, are all variable.

Properties of good water: perfect clearness, freedom from odour or taste, coolness, good aëration, and a certain degree of softness.

### **Water is Purified as follows:—**

1. Exposure to the air in divided currents, as if passed through a sieve. This removes offensive organic vapours, and is said to dissolve organic matter.

2. "*Boiling and Agitation.*—This plan gets rid of calcium carbonate, iron in part, and hydrogen sulphide, and lessens, it is said, organic matter. It is uncertain if boiling will completely destroy the poisons of the specific diseases, but it is highly probable. It will not destroy completely all *bacteria*, or at least, their germs still live. . . . Tyndall's experiments have shown that there are stages in the life of *bacteria* during which they can resist almost any moist heat. But as they soften before propagation, a solution can be successfully sterilised by repeated boilings so as to attack the several crops of *bacteria* in their vulnerable condition. Most *fungus* spores are killed by boiling."

3. *Alum.*—About 6 grains of alum ought to be added to the gallon of water before boiling, as it removes any carbonate of lime present. Sulphate of lime is formed, and this and the bulky aluminium hydrate entangles all floating particles in the water, and carries them down. It is the suspended matter that is thus caught, not dissolved animal or mineral matter.

Alum is not quite as innocent a substance in either bread or water as is by some supposed.

"In many districts, where the only water obtainable is muddy, it is the practice to place a pinch of alum in a large butt of water, to clarify it by precipitation of the suspended impurities. The men in such parts drink nothing but beer. I have never seen among the wives of these men who drink such water a perfectly healthy woman."—*Fox*.

4. "*Lime Water* (Clarke's patent).—By combining with carbonic acid, it causes almost all the calcium carbonate previously and newly formed to be thrown down. It also throws down suspended and a certain proportion of dissolved organic matters,

and also, it is said, iron. It does not touch calcium and magnesium sulphate and chloride.

5. "*Sodium Carbonate*, with boiling, throws down lime, and possibly a little lead, if present."

6. *Potassium or Sodium Permanganate* (Condy's fluid).—It removes offensive odours from water, and oxidises both animal and vegetable matter, yet some organic substances are not affected by it. To use it, add a teaspoonful of the fluid to three or four gallons of water; stir and add little by little until a faint pink tint is left; let it stand for six hours, then add for each gallon six grains of alum; if the water is soft add a little carbonate of soda; let it stand for 12 hours, and if not clear filter.

7. *Perchloride of Iron*.— $2\frac{1}{2}$  grains to a gallon of water gets rid of suspended organic matter and muddiness. It is a powerful oxidising agent.

8. *Strychnos* (Potatorum).—The fruit is used in India beaten into a paste; it is rubbed on the inside of casks or water jars; it seems to act after the manner of tannic acid and the alkalies; for the same reason boiling water with tea is useful.

9. *Charring the inside of Casks*, or the immersion of pieces of charcoal, is also an effectual plan.

"To put these facts in another form:—

"*Organic matter* is got rid of most readily by exposure to air, boiling, agitation, charcoal, alum, potassium permanganate, astringents.

"*Carbonate of lime* by boiling and addition of caustic lime.

"*Iron* by boiling and lime water, and in part by charcoal.

"*Calcium and magnesium sulphate and chloride* cannot be got rid of.

"It should be remembered that some water plants have a purifying effect, apparently from the large quantity of oxygen they give out; and this takes place sometimes though the water itself is green."—*Parkes*.

In order to purify water at the front, or with a vanguard of an army, solid substances are to be preferred to those which are in a fluid state, as they are not so liable to destruction.

To the above must be added, as a means of purification, the different methods employed in the process of filtration. In camp various expedients may be had recourse to for extemporising means of filtration; these will depend on the materials at the disposal of individuals and their ingenuity, urged on by necessity.

The ration of fresh water for cooking and drinking supplied to men on board ship is eight pints a day in, and  $6\frac{1}{2}$  pints out of the tropics. For these purposes, in a temporary camp, an average of one gallon a day is considered sufficient; in stationary camps however not less than five gallons should be allowed for all purposes, and in hospitals eight gallons. The allowance of

fresh water at Suakin during the active operations in 1885 was two gallons for the troops, and one gallon for the native followers.

A horse, mule, or ox will require six gallons a day for drinking. The camel is not a regular drinker.

**The Weight and Bulk of Water** are questions connected with its transport and stowage. M.Os. in the field must demand what carriage they require.

One gallon of water weighs roughly 10 lbs., one cubic foot of water, or  $6\frac{1}{4}$  gallons, weighs 1,000 ozs., or  $62\frac{1}{2}$  lbs.

The iron tanks which are used to hold fresh water on board transports measure four feet every way, that is, 64 cubic feet; they hold 400 gallons each. 224 gallons of water weigh one ton. On this basis estimates for transport may be formed.

With wheeled transport, one regulation water cart, to hold 108 gallons, forms part of the equipment of a bearer company; in a field hospital there are two of these carts. The new regulation ambulance wagon will hold in the locker  $9\frac{1}{2}$  gallons. The old pattern wagon carried five gallons in a barrel attached to the front of the wagon. With pack transport three pairs of barricoes, or breakers, to hold five gallons each, are issued to bearer companies and field hospitals.

The water tanks of galvanised iron supplied for pack transport at Suakin were of three sizes,  $12\frac{1}{2}$ , 10, and 8 gallons. Two  $12\frac{1}{2}$  gallon tins when filled weigh about 316 lbs., not including the weight of the saddle; these would be a sufficient load for a camel if on the march daily for any considerable time. The eight gallon tanks could be carried on mules, but mules drink not less than two gallons of water a day. Although a camel ought to be watered daily, he can go for some days without water.

At the advanced depôt and at the base, the iron tanks used to hold water on board ship were employed. Iron tanks are at all times preferable to wooden ones for the stowage or transport of water. A committee in Cairo considered the advantages of different patterns of appliances for carriage of water for the Suakin expedition, and tanks as above were approved of. India-rubber bags and leather skins when new give a disagreeable taste to water, and are at all times easily tapped and tampered with. Some skins supplied were far more than disagreeable in themselves. India-rubber bags, however prepared, after use in a hot climate, will not keep in store for re-issue in case of necessity.

**Distilled Water.**—The water used by the troops at Suakin was all distilled from the sea; it was not unfrequently found to be slightly brackish, rendered so through some leakage in the tubing of the apparatus, or defects in the process whereby water from the priming box or boilers got over into the condensers; although no animal or vegetable life can pass through the evaporator, still, where salt water from the source of supply finds



its way, water containing low forms of life may also escape. Manifestly there is a danger in distilling water for drinking purposes from stagnant lakes, ponds, creeks or other impure sources. Occasionally some grease comes over through the distilling apparatus. Distilled water may be contaminated by lead, zinc, or copper. Water rather too salt for drinking by itself may be mixed with oatmeal or barley, or used for boiling vegetables.

During the summer of 1885 at Suakin, enteric fever and dysentery prevailed among the troops. All the food was imported into the place, and every drop of water for cooking and drinking was distilled from the sea. This fact often reminded me of Ferguson's remark—"True dysentery is the offspring of heated moisture of moist cold in any shape after excessive heat; nothing that a man can put into him could give him true dysentery."

**The Drainage of the Site** for a permanent camp is of great importance. The Commission state—"Any amount of labour bestowed on draining will be amply repaid in the expense saved by preventing disease." But as to the notion advanced by them respecting the density of its population, that a camp must be regarded in the light of a town without pavements or proper drainage, is rather far-fetched; the analogy is very remote indeed, and may tend towards a belief that all positions in occupation by troops require a system of drainage to be applied to them after the manner of towns.

**Rest.**—The hygienic advantage of a compressed camp when used for temporary purposes is the facilities it affords for internal communication, and the distribution of supplies after long marches. Lord Wolseley rightly says—"The first sanitary consideration is that the men should have rest." This should be borne in mind by all concerned. Staff officers ought not to be too fastidious concerning the regularity of a regimental encampment; if a C.O. is found fault with in this respect he will probably disturb and worry his men; C.Os. soon learn to make the most of the ground allotted to them; no one should expect perfection at starting on a campaign.

When reporting on a proposed site for encampment these points should be specially noted:—

1. *Water*—source, quality, and quantity.
2. *Fuel*.
3. *Provisions*. Colonel Maurice says—"We are so accustomed to obtain food for ourselves and servants without any difficulty, that we are apt to forget that 50,000 men and 20,000 horses collected together into one locality require, besides water, about 250 tons weight of food daily. It cannot be obtained locally, so most of it has to be brought up from the rear by railway or in horsed wagons."

4. *Communications*.—Roads leading to and inter-communication.

5. *Nature of Surface and Cultivation.*—A rugged surface with loose stones will deprive men of rest; plough land is objectionable; grass land is healthy, so is growing corn; while moss, sedges, rushes, and rank vegetation are to be avoided; so should brushwood, except on a dry soil. Forests are by no means as healthy as the open country; on the other hand, should the weather be cold, a wooded country has the advantage of affording shelter and the comfort of good camp fires. Orchards and fruit trees are not objectionable when the fruit is ripe; soldiers may derive great benefit from the use of the fruit, and so may the sick and wounded.

6. *Soil and Subsoil.*—Some places, presumably malarial from situation and appearance—such, for instance, as Suakin—may be found by the test of habitation not to be so. As the active operation of malaria only occurs after it is brought in contact with atmospheric air, where its presence is suspected the surface of the soil should not be disturbed more than is absolutely necessary. Malaria has its basis of operations beneath the soil, and its line of communications with the surface, which is its zone of operations, is by means of fissures in the earth, or other passages due to its porous nature; consequently, the ground occupied by persons in camp in malarious countries should not be turned up, exposed by the removal of brushwood, or disturbed in any way more than is absolutely necessary. With respect to this, the soldier should observe the adage, “Let sleeping dogs lie.”

The shape and strength, etc., of positions are almost essentially military considerations.

In observing a site for an encampment under these various heads with a knowledge of what each condition is likely to effect, in the absence of direct evidence, by narrowing the field of observation in connection with each object through a system of exclusion one may fairly express an opinion. The next best thing to knowing the cause of anything when settling a question such as may here arise, is to know what is not its cause. This process of exclusion is the one we usually adopt in ascertaining the nature of an illness the cause of which is not manifest.

**Ground Air.**—At night, when the ground surrounding a tent is chilled, a tent heated by reason of its being filled with men, acts after the manner of a funnel or soaker, and draws up moisture and air from the soil. Subsoil air contains far more carbonic acid than atmospheric air; in some localities subsoil air is said to be the cause of periodical outbreaks of diarrhoea. To cut a hole in the top of a tent with the object of getting rid of this by ventilation is of little use, as the air passing through the opening only acts by diffusion. The heaviest gases and moisture within a tent have a tendency to remain near the bottom where the men are. The diffusion of a gas is as the square root of its density, but this law must be considered in connection with their relative temperatures within and outside the tent. However, the

material exhaled from the body, and which contains the most dangerous impurity, is not a gas, and can only be removed by the perfusion of air through a tent. Men when sleeping in tents should always be instructed to cover the ground with their waterproof sheets, and roll up the sides of the tent during the day. See p. 200.

**The Dimensions and Form of Camps** is a sanitary subject which has reference to the density of the population of a locality, or surface overcrowding, which is at all times a fertile source of inefficiency; it is chiefly due to overcrowding that certain diseases came to be regarded as camp diseases.

The Regulations and Instructions for Encampments state full sized and minimum sized camps for field service for each unit, but between the two sizes given, camps of an intermediate size may be formed. Now with respect to measurement:—

*Measure of Length.*—6 paces of 30 ins. = 5 yds.; a rod, pole, or perch =  $5\frac{1}{2}$  yds.; a chain = 22 yds. (the distance between wickets); 8 furlongs, or 80 chains = 1 mile, or 1760 yds.

*Square, Surface, or Land Measure.*—A foot = 144 ins.; a yard = 9 ft., or 1296 ins.; a rod, pole, or perch =  $30\frac{1}{4}$  yds.; a chain = 484 yds.; a rood = 1210 yds.; an acre = 4840 yds.; a mile contains 640 acres = 3,097,600 yds.

For rough calculations 70 yds.  $\times$  70 yds. will equal an acre.

The war establishment of an infantry battalion is 1,000 rank and file, 49 sergeants, 16 drummers, 1 warrant officer, 28 officers; total of all ranks, 1,096. Distribution: 8 companies at the front—four of 123 and four of 124, including officers; at the base, 95; and with head-quarters, 13 = 1096.

The regulations state the camp for an infantry battalion, “maximum space,” as frontage, 120 yds.; depth, 180 yds. This is about  $4\frac{1}{2}$  acres. Plan of camp and distribution:—Men’s tents in 8 rows, with 8 tents in each row. In the centre of the camp there is an open space 42 yds. wide. The centre street and parade ground separates the half battalions, leaving 4 rows of tents on either side. The space between the poles of each tent in a row is 9 yds.; this leaves a passage of 3 yds. between the tents. The distance between the poles of the tents laterally is 12 yds.; this allows of a passage of 6 yds. between the companies for their parade grounds. In the rear of the men’s tents of the right-half battalion are the officers’ tents, 14 in number; in rear of the left-half battalion is the men’s kitchen. Then come the horse lines for regimental transport animals and officers’ chargers; a line of wagons and carts occupy the extreme rear. The total number of tents required by a battalion is 78.

Taking 120 yds.  $\times$  180 yds. to equal an area of 21,600 yds., with 4,840 yds. to the acre, about  $4\frac{1}{2}$  acres will be required for 1,096 men; or, taken by the mile,  $3,096,600 \div 21,600 = 143$  battalions, a density of population equal to 156,728 men to the square mile.

But with respect to such an extensive area as a mile, an allowance must be made for the intervals between the units comprising the force, which should never be less than 10 yds. clear of the tent ropes, and the distance between the rear of one line and the front of another, which should never be less than 100 yds. Moreover, mounted corps are of necessity spread out more than infantry; thus a cavalry regiment of 666 strong will occupy over seven acres. Presuming that the nature of the ground will permit of men being camped to the greatest advantage, such as on an open plain, the number of men that can be camped according to regulation on a given space will depend upon the composition of the force and the number of its units. The relative proportion of the different arms is usually one mounted to six of the dismounted services.

An infantry camp compressed according to the minimum space allowed by regulation is laid out on the same plan as when the maximum space is allowed, but the area to be occupied is reduced to a frontage of 60 yds.  $\times$  130 yds. deep. The distance between the tent poles either way will then be only seven yards, leaving a passage of only one yard between the tents.

Although the primary overcrowding in a camp must be judged of by the number of men in each tent, especially if badly ventilated, over-compression within the lines is an additional way of depriving men of air, which should be allowed to circulate as freely as possible amongst the tents. Surface overcrowding by both these means is the surest way of developing disease and spreading infection, while the most efficacious means of arresting epidemics in camp is by reducing the number of occupants in the tents and spreading troops over a larger surface.

**Camp for Bearer Company, M.S.C.**—Front, 60 yds.; depth, 140 yds. This gives a space of 8,400 square yards, nearly equal to 1 acre and 3 roods. However, the depth of the camp may be reduced to 100 yards. The arrangement of this camp from front to rear is: guard tent, general service wagons, horse lines between the tents, five tents on either side, officers' tents, kitchen and ash-pit to the rear; number of tents, 15.

**Camp for Field Hospital.**—Front 70 yards, depth 160 yards. This is the same measurement as required for the camp of a battery of artillery at half intervals, a mountain battery, an ammunition column, or a company A.S.C. The space given is 11,200 square yards, equal 2 acres  $1\frac{1}{4}$  roods. The arrangement of the camp from front to rear is as follows:—Tents for sick in front in five rows, with five tents in each, at intervals of 14 feet between the poles. In rear of these tents surgery, office, and operating tent, then four tents for orderlies, water carts, kitchen, and ash-pits, officers' tents, attached transport, horse lines, and four tents for detachment A.S.C., wagons and mortuary; total number of tents, 40. See p. 415.



Infantry battalions encamp in column of companies, but if the front is very limited by double companies. Cavalry regiments encamp in column of troops or of squadrons. The following relative to encampments in India is taken from Dr. Gordon's "Hygiene:"—

**Bengal.**—"In Bengal the ordinary private's tent is 20 feet long by 16 broad, the height of the kurnat, or wall, is  $5\frac{1}{2}$  ft., and to the poles  $10\frac{1}{2}$ . The outer 'fly' consists of three folds of cotton cloth of a pattern or description used specially for this purpose; the inner 'fly' consists of two more, and the kurnat, or out-rigger, of three folds.

"Each tent has two poles, and is calculated to accommodate 16 men, allowing a superficial area of 18 ft. to each."

**Bombay.**—"The Bombay tent is  $22\frac{1}{2}$  ft.  $\times$  15, and contains 22 men, giving a superficial space to each of  $15\frac{1}{3}$  ft."

**Madras.**—"The Madras tent is 21 ft.  $\times$  15, and is intended to contain 25 men, so that each occupant can only have 12 ft. of superficial space."

It is probable that a smaller tent will be substituted for these tents as a service tent.

"The Sepoy's pall is 32 ft.  $\times$  16, and  $8\frac{1}{2}$  high. It weighs 240 lbs., has a superficial internal area of 256 ft., consists throughout of three folds of cloth, and is supported by a pole near either end and a ridge pole.

"The total number of the pattern tents now in use in Bengal, required, is: for a regiment of infantry, 94; for a regiment of cavalry, 60; for a battery of artillery, 17." See p. 440.

**Camp Space in India.**—"In India, a camp for an infantry regiment, or 10 companies, covers a front of 210 paces and a depth of 360; the pace being equal to 30 ins.; a cavalry regiment, or six troops, a front of 360 paces, with a depth of 400; a battery of artillery a front of 110 paces and a depth of 300."

**Form of Encampment.**—The following are the principles which have mainly led to the establishment of the forms of encampment laid down, and, however troops may be encamped, these principles should govern the disposition of the camp.

1st. The means of passing freely through the camp should be maintained.

2nd. The tents, bivouacs, or huts should be disposed with a view to the greatest amount of order, cleanliness, ventilation, and salubrity.

3rd. The camp should be as compactly arranged as possible, consistently with the above considerations.

With large bodies of troops a straggling camp should, when practicable, be avoided, as it increases the labour of fatigue duties, delays the delivery of supplies, and impedes the circulation of orders.

**General Instructions—Precautions to be taken.**—Whenever troops remain in camp more than three days, tents

should be struck every two days. All arms, straw, and blankets should be removed from the ground covered by the tent, and the ground should be swept clean with a broom, or branches of trees, and left exposed to the sun and wind. Blankets, clothes, etc., should be spread out to air, and the tent roughly pitched in the intervals of the camp, with slack ropes, and the fly loose to allow it to be well blown about; tents should never be pitched for occupation in the intervals. Men invariably at night urinate round the tent, and consequently pollute the ground.

If troops remain more than one night in camp, the tent fly should be rolled up the first thing every morning; in rainy weather, the fly may always be rolled up on the leeward side of the tent.

As a rule, the doors of the tents should face the head of the column, but this rule should never prevent their being turned away from the prevailing wind when necessary. With mounted corps the doors face the horses.

Trenches should be dug round tents, and a drain should connect these trenches, so that the water may not lodge in them, but run freely off. The first wet day after the camp is formed, officers commanding companies should personally examine the ground on which their companies are encamped, and should see that proper drains are constructed. Half-an-hour's work on a wet day, when the natural run of the water can be seen, will do more to keep the camp healthy than a day's labour in dry weather.

**Position of the Different Arms.**—It is merely necessary to say that cavalry and artillery, on account of their horses being liable to take fright, and mounted corps taking longer to turn out than infantry in case of an attack, are never placed on the flank. Engineers usually camp close to head-quarters. Depôts of provisions and ammunition, etc., should be placed in a central position, with easy access to all parts of the camp. These depôts should be close to a good road, to allow the supplies to be brought in. The supply and transport corps should camp near the depôt.

**The Position of the Hospitals** is not stated in regulations, but they ought to be central, towards the rear. A bearer company should camp near a field hospital, and the men should assist the hospital establishment in pitching tents. On the line of march the field hospital accompanying a division should follow the bearer company towards the rear of the column.

**Laying-out the Camp.**—This is done by the staff-officer, who provides himself with a sketch of the ground. Four markers are detailed from each corps to mark the site of its camp. On service no camp colours are used; the ground is marked simply by the men, or by other means improvised on the spot.

Marching into camp, everything should be arranged beforehand. "Soldiers hate being humbugged about," as they say. The men want rest, shelter, and food, and if possible ought to have all three without unnecessary delay.

**Pitching Tents.**—A squad of six men will be required to pitch a tent. The men are numbered off by a N.C.O.; No. 1 front-rank poleman; No. 2 rear-rank poleman; Nos. 3 and 4 pegmen; Nos. 5 and 6 unpack the tent. The N.C.O. superintending the squad should see that the pole rests in its proper place, as marked by a peg, and that the tent faces in the right direction; all intervals are measured from pole to pole. When opening tents the men ought to observe how they have been packed in store.

**A Circular Tent** is 10 feet high, 14 feet in diameter, with a cubic content of about 512 feet,—the same number as there are pounds weight in a hospital marquee—it is complete with 1 valise, 1 pole (in two pieces), 1 peg-bag containing 42 small pegs and 2 mallets. Spare mallets, poles, and pegs are allowed at the rate of five per cent. on the supply. It is well that a N.C.O. when drawing tents from store should know that he is entitled to these extra pegs. Full details of the component parts of tents and directions for pitching and striking them may be found in the M.R., Part II.

**Distinguishing Flags and Lamps,** which indicate the position occupied by the staff and departments.

The head-quarters of a general commanding an army corps—a Union Jack, at night three lamps, one white between two red ones.

The head-quarters of a general of division—a square red flag, at night two red lamps.

The head-quarters of a brigadier—a triangular red flag, at night one red lamp.

The position of the D.A.A.G. "B" at divisional or brigade head-quarters—a blue flag with white centre, at night a green lantern.

The O.S.Os.—a blue flag with red centre, at night two green lamps.

Hospitals are distinguished by a white flag with the Geneva red cross, and at night by a red lamp between two white ones.

In standing camps the position of general officers and heads of departments should be indicated by sign-posts, and the initials of the department or offices fastened over the door of his tent; thus people are enabled to find their way about.

**Flooring for Tents.**—Wooden bottoms to circular tents or waterproof ground sheets for tents are only issued under exceptional circumstances affecting health; as, for instance, in camps intended for prolonged occupation, such as musketry and artillery practice camps, and in those to supplement barrack accommodation, when owing to dampness of the ground or other causes

their use is certified to be necessary by the P.M.O. Each hospital marquee complete has a wooden bottom.

When wooden bottoms are not available to meet the issue sanctioned, waterproof ground sheets will be supplied instead. Waterproof sheets may be supplied in camps established for short periods, when requisite, owing to the ground being damp and straw cannot easily be procured, but they are issued subject to the same restrictions as wooden bottoms.

**Straw.**—When straw is issued for the use of troops in camp, it should be made into mats and not left loose at the bottom of the tent. Each man should have two mats, one for his head and shoulders and the other for his legs. These mats are easily made; they should be hung up to dry every day.

In camp, straw may be supplied on the following scale, according to the Allowance Regulations:—

(a.) *When Palliasses and Waterproof Sheets are not issued.*—72 lbs. for every 5 men—to be refreshed at the end of 8 days with 36 lbs., and at the end of another 8 days with 36 lbs. more; at the end of 24 days the whole to be removed, and a new bedding of 72 lbs. issued, and so on, as before.

(b.) *When Palliasses are issued.*—36 lbs. for every two men,—to be refreshed at the expiration of 16 days with 18 lbs.; at the expiration of 32 days the whole to be removed, and a fresh bedding issued, and so on, as before.

(c.) *When Waterproof Sheets, but not Palliasses, are issued.*—No issue of straw will be made unless the circumstances are very exceptional.

Good oat straw is the most suitable for mats and for camp bedding generally. If from 12 to 14 men are placed in each tent, two trusses of 36 lbs. each for every five men will give to each tent about 180 lbs. of straw. This will generally be found sufficient to make mats, but if from the quality of the straw or other causes a larger supply in the first instance should be deemed indispensable for this purpose, it is left to the discretion of the O.C. to direct the issue of an additional quantity, provided the total amount supplied for the 24 days does not exceed four trusses of 36 lbs. each for every five men. This allowance is considered sufficient even during the prevalence of heavy rains; but if the weather should be fine and dry, less will be required.

Whether mats are used or not, only such a quantity of straw as may be absolutely necessary for the comfort of the men will be drawn, as it causes much litter in the camp.

Straw when issued for the sick in field hospitals will be changed when required. It is necessary that the straw supplied should be in a sound and wholesome state. In Egypt, in 1882, some forage sent out which horses declined to eat was issued to the troops to lie on, and it was found to be too bad even to be used in this way. During the American Civil War an epidemic



of measles was said to be due to the use of contaminated straw for bedding; undoubtedly disease may be communicated to the troops in this way.

Straw is always issued in trusses of 36 lbs. each. The weight of a truss of hay varies; one truss old hay = 56 lbs.; new hay, 60 lbs.; 36 trusses are a load.

“When troops are encamped on the line of march for only one or two nights, neither straw or extra blankets need be issued to them.” This is the rule, but to cover the issue, should it be deemed necessary before it is made on the requisition of the C.O., the M.O. must certify that it is “indispensably required for the health of the troops.” The issue here is not to exceed 72 lbs. for every five men. Waterproof sheets for tents are obtainable not from the Supply Department, like straw, but from the Ordnance Store Department, and their issue is only made “under exceptional circumstances affecting health.” It is well to note the regulations on the subject, as M.Os. are not unfrequently urged to move in the matter and to write strongly so as to obtain sanction for the increased expenditure, while the necessity of the case may be little more than discomfort for one or two nights. Moreover, from the writings of authorities, military and medical, a false impression may be conveyed to officers as to the facility with which they can obtain such personal comforts for their men.

**Arrival of Troops on the Ground.**—The following parties should be told off and paraded by the adjutant or other officer. In bivouacs, whether with cavalry or infantry, the same cooks and fatigue parties should be detailed as in camps, and the same system must be observed in all arms.

*Cooking Party.*—Two men per company, under the sergeant-cook.

*Latrine Party.*—All the pioneers and two men per company.

*Water Party.*—One N.C.O. and two men per company, under a sergeant.

*Ration Party.*—A N.C.O. and two men per company, or more if the company is strong, under the quartermaster-sergeant.

*Wood Party.*—Two men, or more if requisite, and a N.C.O. per company.

The remainder will sit down close to the piles of arms.

The sergeant-cook will select the place for the kitchen, within the space marked out by the camp colours, and will make the kitchen as soon as the tools can be procured.

The sergeant of pioneers will at once begin the latrines, it being essential that the ground should not be fouled; for this purpose he will dig a narrow trench some 15 ft. long and about 1 ft. 6 ins. deep. If the camp be only for one night, this will suffice; if for a longer period, this trench may be filled in and a deeper and larger one made, brushwood, branches, or grass being used to give a little shelter. The position of the latrines

must be left to the discretion of the staff or other officer encamping the troops. They should be at a distance from the water supply, and usually in rear of the lines.

**Cooking.**—At least eight or ten men per company ought to be instructed by the sergeant-cook in making field kitchens, cutting up meat, and cooking. “It is a matter of paramount necessity that the soldiers’ food should be carefully looked after. This duty should never be left to a N.C.O., but should be carefully attended to by the company officers themselves.”

When a battalion encamps, the cooking party, consisting of the sergeant-cook, the assistant-cook, and two men per company, will proceed to make the kitchen. If the encampment is only for a night, one trench per company should be dug 6 ft. long, 9 ins. wide, and 18 ins. deep at the mouth, and continued for 18 ins. into the trench, then sloping upwards to 4 ins. at the back, with a splay mouth pointing towards the wind, and a rough chimney, 2 ft. high, at the opposite end, formed with the sods cut off from the top of the trench. It will be advantageous if these trenches are cut on a gentle slope.

This trench will hold six Flanders or nine Torrens’ kettles, and will cook for about 50 men. **Cooking in Barracks**, see p. 288.

All brushwood and long grass should be carefully cut for a circle of 20 ft. round the kitchen, and may be used to light the fire with.

The water party must bring up the requisite water in camp kettles, which are of two kinds—the Flanders, or large pattern, which will cook for 8 men, or, without vegetables, for 15; and the Torrens’, or small, which will cook for 5 men, or, without vegetables, for 8. The former kettle weighs  $8\frac{3}{4}$  lbs., the latter 3 lbs. The Flanders kettle is generally used where transport is provided, the Torrens’ when the men themselves have to carry the kettle. Each company should mess by kettles—that is to say, the mess should be composed of a number of men according to the kettle used.

The dinners ought to be ready in an hour after the kettles are put on the fire.

If there is no time to dig a trench, or the ground be hard or sandy, the kettles may be placed in rows 10 ins. apart, and the fires lighted between them, the heat being thus applied to the sides in place of the bottom. By this method, however, the cooking takes a little longer, and requires a little more fuel. *Troops should, under all circumstances, have their dinners ready one hour and a half after the rations are issued.* On damp or marshy sites a wall trench will be found to answer best.

A trench to hold 10 Flanders or 20 Torrens’ kettles will cook for about 100 men.

If troops remain in camp more than a day or two it is advisable to make a regular field kitchen; of these there are two kinds in use in the service, the broad arrow and the covered kitchens.

1. *The Broad Arrow Kitchen.*—The broad arrow kitchen (Alder-shot pattern) consists of three trenches converging to a point, with their mouths connected by a transverse trench, and a flue 14 ft. long connecting these trenches with a chimney 5 or 6 ft. high, formed from the turf cut from the top of the trenches and other sods obtained for this purpose.

Such a kitchen can be constructed with one N.C.O. and five men in four hours, to cook for 220 men with the Flanders kettle, or for 165 men with the Torrens' kettle, and will last a fortnight.

*Triple Arrow Kitchen.*—To cook for a regiment or battalion it would be necessary to construct about two additional arrows, placing them one on either side of the one already constructed.

Time required to construct, 10 hours, working with 12 men.

2. *The Covered Kitchen.*—The working party for this kitchen is one N.C.O. and 25 men.

The kitchen should be completed in five to six hours.

This kitchen can also be used as a drying shed.

When using the Flanders kettles, it may be calculated that 1 ft. 2 ins. of fire trench will provide for cooking for 20 men.

**The Service Kettles** are as follows:—

Name.	Weight.	Contents.	Diameter.	Depth.	No. of men to cook for.
	lbs.	gallons.	inches.	inches.	
Flanders kettle, large - - -	8 $\frac{3}{4}$	3	12	11	20
Camp kettle, light - - -	2 $\frac{1}{2}$	1 $\frac{1}{2}$	9 $\frac{3}{4}$	7 $\frac{1}{2}$	10
Torrens' kettle - - -	3	1 $\frac{3}{4}$	11 $\frac{1}{4}$	10 $\frac{3}{4}$	11

**Field Ovens.**—The simplest form of field oven is formed by an arch of hurdles over a hearth sunk below the surface of the ground, the hurdle work covered over with clay or sods. Hoop or sheet iron is generally used in their construction. An oven might be completed in four hours. Where sheet iron is available it can be made in two hours. Used for making bread.

**Bivouacs.**—Bivouacs are encampments without tents or huts; the principles enumerated for the selection of a site applies equally to both. Bivouacs should never be resorted to unless an immediate collision with the enemy is expected; here "military and not sanitary considerations will be found to be of primary importance.

"The area required for the bivouac of each unit, except infantry, may be considered as practically the same as that laid down for a minimum camp, and it should be occupied on the same principle."

Bivouacs admit of the maximum concentration of troops, and afford the greatest facility for their rapid assembly.

The disadvantages of bivouacs are overcrowding of the men, and their exposure to wind and weather, and to the natural

dampness of the earth. Such vicissitudes may at times be inseparable from a soldier's fare; still men should never be needlessly exposed without shelter at night, and protection from the humidity of the soil, as loss of efficiency is sure to follow on such conditions, although its baneful effects will be modified by climate, season, the nature of the soil, and physical features of the country.

In the former edition of the Regulations for Encampments it was stated—"The chief object of all officers in bivouacking must be to harass the men—already worn out perhaps by a fight or a long march—as little as possible, and to restore their fighting power by making them as comfortable as circumstances will allow."

In the present edition this has been omitted, although a very important matter, probably on account of the implication that the men are more or less harassed by their officers on these occasions.

It is the duty of the commander and of his staff to ensure as far as possible security from attack while the men are in a state of rest. Nothing is more harassing to men than to have their camp fired into at night.

Divisions are generally broken up into brigades or regiments. When in bivouacs this admits of greater space for the circulation of air between the different units, allows of a better arrangement of the latrines, while the smoke nuisance from camp fires is also more under control.

Major F. C. H. Clarke, R.A., says—"In 1812, we find Napoleon making the great mistake of not adapting his system of conducting warfare to the nature of the country. From the Vistula to the Niemen, the troops were continuously in bivouac. Rapid marches, it is true, were made in consequence, but at what cost to the effective is shown by the ultimate result of that war.

"In the present day, as great an effort as possible from the very commencement, rapidity, energy, and uninterruptedness of the operations, are considered the indispensable conditions of success in war. Consequently, wars are now speedily pushed to a decisive issue; an adverse battle at the outset may affect the whole campaign, and therefore the question of 'sparing' the health and strength of the troops until the moment of collision acquires very great importance.

"Even at the outposts, when fighting was going on, the German troops in the winter of 1870-1 used the houses in the vicinity for sleeping." "It was the practice when the weather became inclement for all the outposts, except the actual sentries, to be under some sort of cover, otherwise the men simply perished from the cold. Probably the pickets are more liable to surprise under these conditions; but, on the other hand, the farms or villages, in the event of a sudden attack, offer points of



support for the defence. In any case, an occasional surprise was regarded as nothing compared with the evil caused by keeping troops continually in bivouac."

The advantage of a fire under cover, especially during broken weather, when compared with one in the open, is so great that the Germans adopted the fire-place as the basis upon which to estimate the number of soldiers who could be quartered in a town; the number of fire-places being unknown, they assumed it to be  $\frac{1}{4}$  or  $\frac{1}{2}$  the number of inhabitants; where the troops remained for one night 15 to 20 men were billeted on a fire-place, but according to the time they stayed the number was reduced. This may be an easy method to adopt in a town where a record of the number of fire-places is kept, but it does not appear that cubic or superficial space entered into the estimate. As a rough way of calculating the number of men that can be accommodated in houses of an occupied town, General Viscount Wolseley says for each yard in length of a room 15 ft. wide, 1 man, from 15 ft. to 25 ft. 2 men, 25 ft. 3 men. See p. 197.

## CHAPTER XIII.

## AN ARMY CORPS—ITS ORGANIZATION, ESTABLISHMENTS, AND MEDICAL SERVICES.

THE principle of army organization we adopt is to keep the establishments of the different units on as low a scale as compatible with such efficiency as is required to carry on garrison duties, or render them capable of performing drill manoeuvres and instructions on field days. Although the staff, the officers, and N.C.Os. do not require much augmentation when war comes, a great deal must be added to render the nucleus really serviceable and numerically efficient.

The dress of the soldier must be changed to suit the climate in which he is about to operate. He must be equipped and supplied so as to render him as capable of independent action as possible. Regimental transport and camp equipment must be supplied, and provision must also be made for the carriage of reserve ammunition, etc. Field stretchers, field companions, or panniers must be added, and a M.O. attached to the unit in order to render it as complete within itself and as independent as possible. Because these things are required for war, it is obviously unnecessary that they should be specially allotted to a regiment in time of peace.

**Organization.**—An army corps is composed of all arms of the service. Here the different tactical and administrative units are combined, admitted into the organization of the corps, for the most part after their having been first allotted to a brigade or division. The corps is thus built up from different military units. A division of an army corps, or a division of cavalry, composed as it is of cavalry, mounted infantry, and horse artillery, being a mixed body of troops, is regarded as a tactical unit complete within itself, and capable of independent action. It is in connection with this principle of organization for war service that an administrative M.O. is appointed to each division in order to complete the unit and assimilate the medical with the rest of our military organization.

Furthermore, with regard to position. Wherever a body of troops are operating, there are two fixed strategical points of primary importance for the existence of an army in the field, namely, the basis of operations and line of communications between the base and the front, which is a movable position. To both these points a general or other officer and a special staff are appointed, including administrative M.Os. Whatever the object of the expedition or plan of campaign may be, provision

must be made to ensure these points being held and efficiently organized in every particular. Consequently, in an army corps of three divisions and cavalry division attached, with a special staff for its base of operations and line of communications, six administrative M.Os. will be required, including the surgeon-general in charge of the entire force.

Our military organization is the basis and foundation of our army medical organization and hospital system.

The medical organization is within and subservient to the general organization of the army, and will not work outside it. To endeavour to work independently of existing regulations, on some improved principles, not embraced within our present system, would be maladministration. With the Medical Department in the field, organization and system will alone ensure success.

**Army Corps Details.**—An army corps is formed of three divisions of two infantry brigades each; and corps infantry, one battalion with two machine guns, one cavalry regiment; corps artillery, viz.: three horse, two field batteries, and one reserve ammunition column in four sections; corps engineers, viz.: one field company, one pontoon troop, half telegraph battalion, and field park. A proportion of departmental corps also enters into the formation. There is one field hospital on the establishment for the army corps details. Total at the front, 34,984; at the base, 2,447. This number comprises all the details left at the base in reserve, required as casualties occur. Grand total of the field force, 37,431 of all ranks, with 91 guns. The total number of officers on the staff of the corps is 30, including an administrative M.O. and surgeon-major.

**Medical Services.**—The details of the Medical Staff at the front with an army corps are: attached to the staff, 13; regiments, 37; with six bearer companies, 18; field hospitals, 50. Total, 118, including 13 Q.Ms. Establishment of warrant officers, N.C.Os., and men, 798. This would be in the proportion of M.Os. as 1 to 333, and M.S.C. as 1 to 44 of all ranks. These figures show a considerable reduction of the Medical Staff in the field, chiefly owing to the number of field hospitals being reduced from 14 to 10, not including the two for the cavalry division, which, if added, will give a total of 12 in the field. The sanitary officer and one orderly officer in the corps are done away with, and so are the brigade surgeons, who used to act as P.M.Os. in cavalry brigades and corps troops. One M.O. is now attached to the three horse batteries, and another to the two field batteries, corps artillery.

When an expeditionary force of less numbers than an army corps has to take the field, an estimate of each arm of the service required for the undertaking must be made. Generally it will be found that the proportions of which the force is constituted will be one cavalry to six infantry, one gun to 1,000 cavalry and

infantry. Probably a country requiring engineer services will require the employment of additional artillery; artillery may be estimated as 25 men to a gun, engineers 1 to 30 men of all arms. These proportions must depend upon the nature of the operations, physical features of the country, etc.; and the same conditions will affect the medical establishment; but judging from the organization of an army corps, the proportion of M.Os. would be 1 to 150, and of medical services generally 1 to 20 of all ranks; this would be to provide for the sick estimated at a quarter of the entire force, but not including camp followers. However, this proportion will vary much according to circumstances; the distribution of a force more than the number of its sick or wounded will affect it.

**Administrative Medical Officers** with an army corps, their position, duties, and staff briefly stated.

But little is said in the regulations as to the duty of the surgeon-general in charge of an army in the field. No details of his duties, power, and responsibility are given; but as supreme head of his department, he becomes at least indirectly responsible for the carrying out of every detail; his power over his executive staff is despotic, his responsibility undefined and almost unlimited. "He is on the staff of the army corps, and has supreme control over all medical arrangements and establishments connected with the force;" he is to advise the general "on all matters connected with the medical arrangements of the army, and transmit to P.M.Os. and others such orders as he may receive from him or from the chief of the staff, or that he may himself issue." See p. 379.

The surgeon-general of an army corps will be assisted at the head-quarters of the corps by a staff of two surgeon-majors, one as secretary and the other in charge of the head-quarters staff, and one surgeon as orderly M.O.

**Cavalry Brigade Organization** in the field: brigade staff, three regiments of cavalry of four squadrons each; strength, officers and men 666 and 613 horses, including one pack animal for medical panniers, two machine guns with a detachment of 18 men and 14 horses;  $1\frac{1}{2}$  company A.S.C., one bearer company, and one field hospital. Total number in the field, 2,140; at the base 141. Total 2,281, horses 2,219, carriages 136, including 10 ambulance wagons with four horses each. The strength of a troop of cavalry in the field is the same as a company of infantry, 123, but only 105 are mounted.

**Cavalry Division.**—Two cavalry brigades form a division of cavalry, with an organization similar to a division of infantry, but here the division troops are two batteries of horse artillery, two machine guns, mounted detachments R.E., and a battalion of mounted infantry with departmental details, and one field hospital in reserve.



As at present constituted, neither a cavalry brigade nor division are included in the organization of an army corps, but their medical services are arranged for in a manner similar to that laid down for an infantry brigade or division. However, a division of cavalry, on account of its being made up of smaller and more mobile units, requires 34 M.Os. Heretofore a cavalry brigade, comprising as it did a battery of horse artillery in its organization, was regarded as a unit, capable of independent action, and in connection with this principle had a brigade surgeon in charge as an administrative officer.

The troops for the line of communications are not included in those of the army corps. The number of troops to be employed in this service and the number of M.Os. will depend upon various circumstances. See p. 413.

**Infantry Brigade, Organization in the Field.**—Brigade-staff, four battalions of infantry of eight companies each; strength, 1,000 rank and file. Total, including officers and those who are attached, 1,096, of which 95 remain at the base; a gun detachment of 13 is told-off for the two machine guns belonging to the brigade. One company A.S.C., one bearer company, one field hospital.

*Distribution*, at the front 3,963, at the base 384. Total with field force, 4,347; horses 536, carriages 120, including the 10 ambulance wagons of the bearer company with four guns each.

**Division of Infantry, Organization in the Field.**—This division is formed of two brigades of infantry of four battalions each as above. All the rest of the troops are divisional, admitted into the organization without first being brigaded together, viz.: one squadron of cavalry, three battalions of field artillery, six guns each, one reserve ammunition column, one field company R.E., one company A.S.C., one field hospital in reserve.

*Distribution*, at the front 9,292, at the base 768. Total, 10,060 officers and men, horses 2,164, guns 18 twelve-pounders and four machine guns.

**Division—its Medical Services.**—A P.M.O. of the rank of deputy surgeon-general is appointed to the staff of each division of an army corps, or to a cavalry division; he is assisted by the surgeon-major, who is in charge of the divisional staff, and a Q.M.; he is under the general of the division and the surgeon-general of the army in the field. This officer is responsible for all medical services within the division.

Officers and men of the M.S.C., or others attached for duty to bearer companies and field hospitals within the division, will be under his orders and at his disposal. He will ascertain, by frequent inspections, that the "medicines, surgical appliances, food supplies of all kinds, equipment, shelter, and transport are in every respect sufficient for the wants of the sick and wounded."

He will guard against the field hospitals becoming hampered and overcrowded with sick, and will constantly inform the P.M.O. of the line of communications, and also of the force, as to the number and description of sick and wounded requiring transport towards the base, specifying, if possible, the kind and quantity of sick carriage necessary. He will nominate M.O. attached to a corps in a brigade to attend on the brigade staff.

**Line of Communications.**—These lines are formed after the following manner:—When an army advances from its base beyond a distance which renders it inconvenient to receive its stores, ammunition, supplies, etc., a station is formed, at first regarded as an advance depôt. As the army advances this position becomes intermediate between the front and the base. Here the intermediate magazine depôt and first stationary field hospital are formed. Again, as the army advances, a second station is formed three or four stages further on, with its intermediate magazine depôts and stationary field hospitals, etc., and so on, the line being defended by military posts, which are usually also staging posts for convoys, called communication posts, until the advanced magazine, advanced stationary field hospital, advanced medical depôt, advanced remount depôt, etc., are reached; beyond this is the zone of operations, under the G.O.C., with its first-class transport, ammunition reserves, field hospitals, commissariat parks, moveable or rolling magazines, which are all generally located about two marches in rear of the fighting line.

**“The General of Communications** combines command with administrative duties as the responsible head over all departments and services within his command. The general of communications will preconcent with them all the measures necessary to be taken during the campaign, and they will have to keep him accurately informed, both as to the resources available, and as to the needs and requirements of the army in every respect, be it in personnel or matériel, so that he may be able to make timely demands either to the general commanding the army in the field or to the authorities at home.

“Such an arrangement forbids any divided responsibility; this is centered in the general of communications, who must get the departmental officers to work with him to the best effect, as he should not be allowed to throw the blame of any failure on any department. He would have the power and responsibility, and in issuing orders he would have to rely on the heads of the various departments under him to carry out the details. The direction of the administrative services cannot be dis severed from responsibility. The general of communications alone should be held responsible for everything the army requires; he becomes responsible to the commander of the army, whilst

the latter is responsible to the country for the entire conduct of the military operations.”—*Furse*.

The duties of the staff of the line of communications extends over the base up to and including the advanced dépôts. The detail of troops to be employed on the lines of communication cannot be fixed until it is known where a campaign will take place, the object of the undertaking, the nature of the country and disposition of the inhabitants. However, a proximate estimate is given for a line 200 miles long, viz.:—100 miles of river, 50 of railway, 50 of roads, provided with stations as follows: a base, an advanced dépôt, one special station, two first-class stations, three second-class stations. For such a line it is stated four battalions, with two machine guns each, one regiment of cavalry, two field batteries and a proportion of R.E. and other troops, with six companies A.S.C., will be required.

“Although the general of communications has the supreme control over everything connected with the line of communications service, still in the partition of the work the protection of the line is assigned to the road commandant, under whose immediate orders the communication troops are placed. This officer details them for service at the various posts, or for employment as reserves, just as he thinks most proper. The troops should not be scattered in small detachments, but all that are not needed to guard the posts along the line should be kept, as far as possible, as a reserve, in small masses or groups of all arms, organized on the moveable column system; a system which, by giving each mass great mobility, will permit of a smaller number of troops guarding the line than would otherwise be possible.”—*Furse*.

To the road commandant is also assigned the duties of regulating the traffic. Thus he is the staff officer connected with convoy duty and the protection of the sick and wounded.

**Medical Administration.**—The P.M.O. of the line of communications will be of the rank of surgeon-general; his appointment is on the staff of the line of communications. His duties are in connection with the movement of troops along this line, the passing of medical and surgical stores and supplies towards the front, and the return of sick and wounded to the base. On such matters he will advise with and carry out the orders of his general; his duties are in arranging for the evacuation of sick from the front, and intimately connected with supply and transport departments. Such a line as is here stated will require eight stationary hospitals and two general hospitals—the latter being formed at the base.

“The whole hospital establishments of the base and lines of communication up to the field hospitals, including the dépôts of medical stores, will be directly under his authority, and he will frequently visit and inspect the same, or direct his deputy to do so, and see that they are in a state of thorough efficiency.

"He will at once take under his authority all field hospitals left behind with sick, and all fresh hospitals opened in rear of the army."

The surgeon-general of the army corps is directly responsible for the disposal of bearer companies and field hospitals held in reserve, and not attached to divisions and brigades. These reserves are required to replace or assist field hospitals or bearer companies at the front who may become disabled or used up.

The position of the surgeon-general of the line of communication is a very important one, second to and comparatively independent of the P.M.O. of the entire force. The medical duties here are more administrative, and call for more power of resource and organization than those at the base of operations.

This surgeon-general may be assisted by a deputy surgeon-general as field inspector. His staff consists of a surgeon-major as secretary, and surgeon as orderly M.O.; this staff will be reduced or may require to be strengthened according to circumstances connected with the extent of the line of communications, etc. His administrative control extends over all fixed positions along the line up to the divisional commands and over the base. Unconnected with the inherent organization of an army corps, his appointment is in connection with the two strategical positions referred to, and under the general, whose duties are sketched above.

**The Base Medical Services.**—The administrative staff at the base of operation consists of a P.M.O. of the rank of deputy surgeon-general under the officer commanding the base, and the P.M.O. of the line of communications. He has control over all hospital establishments, including hospital ships. He will be assisted by a brigade surgeon as secretary; and embarking officer, superintending details connected with the embarkation of sick and wounded; a surgeon-major in charge of the dépôt of medical stores; and two quartermasters, one as medical store keeper, and the other in charge of pay duties, clothing and equipment of men of the M.S.C. proceeding to the front, but not of those in hospital. He will take charge of all documents relating to their pay requiring to be left for safe custody at the base; for these he will be accountable, but the P.M.O., on whose behalf he is acting as quartermaster, is accounting officer to the War Office for the clothing and equipment.

The registrar of a general hospital at the base will take charge of documents relating to sick and wounded soldiers; it would be well if he also acted as adjutant to the M.S.C. at the base.

**War Hospitals.**—Field hospitals, according to the M.R., form the second line of medical assistance, but the Q.R. place them third. Thus, (a) M.Os. attached to regiments and corps; (b) bearer companies; (c) field hospitals; (d) stationary hospitals on the line of communication; (e) general hospitals at the base. Field hospitals are only intended to afford temporary relief in



severe cases of sickness or injury, which should be passed on without delay to the base through the hospitals along the line of communication—thus, on the principle of “evacuation,” relieving the front from all incumbrances of sick and wounded.

To each division of an army corps to accompany it in the field is one field hospital in reserve, and one for each infantry brigade in the division, total three. In the field the reserve hospitals are fully equipped, and ready to take the place of any hospital unable to move on account of its sick, or want of transport, or being otherwise disabled.

**A Field Hospital** is a non-dieted hospital, *i.e.*, one where the patients get their field rations cooked for them as may be ordered, but in addition they may receive medical comforts. A field hospital is for 100 patients. Beds, or stretchers to be used as such, are not specially provided as part of the equipment.

*Establishment.*—Two surgeon-majors, two surgeons, one quartermaster, one warrant officer; total, N.C.Os. and men 39, of whom five are batmen, two washermen, one messenger, in all eight men from the reserves. A private is borne on the establishment as a pack storekeeper. *See page 37.*

*Tents.*—40 single circular to accommodate three or four sick, or 15 men in each; two double circular operating tents, two inside circular as latrine tents; total, 44 tents, but when necessary this number may be increased by tents obtained from the division. With the Suakin expeditionary force the East Indian pattern European privates' tents were used, one for eight or nine sick=12 tents for sick. *See pp. 399-401.*

**Equipment.**—When pack transport is provided these hospitals are equipped with eight stretchers, the same number as for a bearer company. With wheeled transport each ambulance is supplied with six non-folding stretchers. These hospitals are not supplied with clothing for patients' personal equipment, but 200 grey service blankets are provided for use of the sick and wounded.

The equipment of field hospitals and stationary field hospitals along the line of communication is given in detail in the M.R., divided into medical equipment and ordnance store equipment; the former is supplied from the medical stores at the Herbert Hospital, Woolwich, and the latter from the Royal Arsenal. These are issued under the heads—Sec. II. Camp and field equipment; Tools, etc., for entrenching; Miscellaneous articles and stable necessities; Pack saddles and appurtenances. Sec. III. Tools, artificers'. Sec. IV. Miscellaneous articles. Sec. V. Ordnance. Sec. VI. Barrack and hospital stores.

*General Organization.*—The carriages of the regimental transport form a portion of the war establishment of a bearer company or field hospital. The O.C. is responsible for their efficiency in the same manner as for other details of his command.

**SUMMARY OF TRANSPORT, SADDLERY AND HARNESS, ARMS, AND  
AMMUNITION IN A FIELD HOSPITAL FOR 100 SICK.**

Transport.				Number.	Drivers.	Draught Horses.	Remarks.
Carts	{	forage	{ for supplies	1	1	2	Details in <i>italics</i> provided by the A.S.C. Demanded by the M.S. on requisition.
		„	tents	1	1	2	
		water	-	2	2	4	
Wagons	{	for medical and surgical equipment		4	8	16	
		baggage equipment, and reserve rations		2	4	8	
		for A.S.C. details		1	2	4	
		Total - - - - -		10 1	18	36	

**SUMMARY TO SHOW A COMPARISON BETWEEN WHEEL AND PACK  
TRANSPORT FOR A FIELD HOSPITAL IN THE FIELD.**

Description of Stores.	Wheel Transport.				Pack Transport.		Remarks.
	Wagons.	Carts.	Drivers.	Horses.	Drivers.	Mules.	
Medical and surgical stores	4	8	8	16	9	27	At 1 driver to 3 mules.
Baggage and reserve rations	2	4	4	8	7	20	
Supplies - - - - -	-	1*	1	2	1	2	At 1 "driver to 2" mules.
Tents (for personnel) -	-	1*	1	2	6	18a	At 1 driver to 3 mules.
Water - - - - -	-	2*	2	4	5	8	" "
Spare - - - - -	-	-	-	-		8	
Total - - - - -	6	16	16	32	28	83	a Including tents for sick. N.B.—The details shown in <i>italics</i> are furnished by the A.S.C.

\* Note.—One supply cart, one tent cart, and two water carts are supplied with the six wagons to complete the equipment when wagons are used.

The camp equipment and stores detailed at length under the above different headings are all ordnance stores. On active service there are no representatives of the barrack branch A.S.C. in the field. All transactions connected with stores are direct with the Ordnance Store Department.

In construction and organization a field hospital is a fixed unit, not over large, cumbersome, or unwieldy; it is supplied with transport, placed under the command of the M.O. in charge, so as to be independently moveable. Mobility is the special characteristic of a field hospital. Although undesirable to keep

many sick and wounded together, two of these hospitals can be brought together to afford increased accommodation in case of urgency.

A field hospital is so arranged as to be easily divided by half; still, this should only be resorted to as a temporary measure to meet some pressing emergency. While either half of a field hospital will form an efficient unit for the relief of 50 sick, there is no arrangement by which it can with efficiency be further subdivided or portioned out into sections. A tent in which sick are treated may be taken as representing a ward, and so it does in so far as a ward represents a hospital for purposes of construction and organization, but it cannot at any time be regarded as a complete and independent unit—a little hospital in itself as it were.

A M.O. with his case of instruments, accompanied by an orderly with a field-companion and water-bottle, may be regarded as the unit of "First Aid to the Wounded," but a field hospital is the administrative unit in our war hospital system. In this respect it bears an analogy to a regiment. All tents, equipment, and transport detached from under the immediate command of the M.O. in charge, who is the "accounting officer," must be regarded as on detachment from him, and he should be careful to obtain receipts for equipment or transport taken from under his charge, for which he will finally be held accountable. Administrative M.Os. should bear in mind the strain on the M.O. in charge which is occasioned by this dividing of a hospital, which appears to be a very simple matter on paper.

A warrant officer is not a recognised sub-accountant to the War Office in matters of finance, although he may perform the other duties of a district Q.M.

In the absence of a Q.M., "a warrant officer attached to a bearer company or a hospital in the field will perform the duties of Q.M.," in which case he will do the duties in relation to the pay accounts of the hospital detachment, as well as those connected with stores, supplies, transport, and equipment, for which the officer in charge is "accounting officer," and otherwise responsible. As a matter of field administration, a warrant officer acting in this capacity *ought not* to be removed at a moment's notice unless in a case of very great urgency. "The Q.M., or officer acting as such, will be responsible that all articles of hospital equipment and stores (other than medical comforts) contained in the medical comfort boxes, canteens, and store and pharmacy wagons are fully detailed and accounted for in Army Book 248. The medical comforts will be accounted for on A.F. F 735." If you have not got a Q.M. you must do it yourself; if you have one see that he does it.

The equipment of a field hospital or bearer company consists of medical and surgical, the personal equipment of the men, and camp equipment, including all ordnance stores.

The arms, accoutrements, clothing and personal equipment of the establishment are held by the C.O. from the principal M.O. at the base, to whom he is accountable; recorded in Equipment Ledger, A.B. 239.

It is necessary for the C.O. to hold a detailed list or return, signed by each man, of the articles in his possession; as a voucher for equipment, he should see to this as a point worthy of his attention.

Camp equipment and stores requisitioned for by the Q.M. through the C.O. should be drawn on A.F. G. 1015, and entered in the Equipment Ledger, Army Book 248, of the hospital or company, the same W.O. form and book being used to complete this transaction in both cases. For this equipment C.Os. are accountable to the senior ordnance store officer of the expeditionary force.

All these stores must be drawn either at Woolwich or at the base of operations; usually drawn in a hurry and under high pressure, they must be accounted for at leisure and in detail at periods varying from one to three years after the termination of a campaign. But the responsibility for equipment does not rest here; in addition the M.O. in charge is accountable for the arms and personal equipment of soldiers passed through or treated in his hospital; of the 10,771 officers and men who took part in the Nile campaign, 8,593 passed through the hospitals.

Placed in a position where you have no Q.M. or warrant officer to act as such in a field hospital, you may order one of the M.Os. to act as Q.M. in addition to his other duties. He ought to receive pay for it, at the same rate and in the same manner obtainable as what is granted for like appointments in temporary corps—mounted infantry, camel corps, etc., for which there *was*, or *is*, no special provision in the regulations.

A soldier admitted to a field hospital brings his arms, accoutrements and ammunition with him. These articles should be entered in the pack store cheque book, with his other articles of equipment, and the man's signature obtained to the foil and counterfoil in acknowledgment of the correctness of the entry. Not unfrequently a soldier will come in, or be brought in, with another man's rifle and equipment; by looking out for this future correspondence may be avoided. Arms should not be removed from the men's possession, but see that rifles and revolvers are not loaded. Make no entry in your equipment ledger of articles brought in thus. Should an O.C. send you a receipt and delivery voucher to sign in acknowledgment of his men having brought their arms and equipment to hospital, don't sign it; for if you do, he may strike these articles off his equipment ledger and file your receipt as a voucher to his accounts, in which case, later on, you probably will become involved in a correspondence.

All men passed into a hospital must be entered in the "admission and discharge" book, and on transfer to another hospital a "medical certificate must accompany them, together



with the counterfoil of the "pack store cheque book," on which their arms and equipment are shown, and a "nominal roll," A.F. I 1226, on which each man's disposal will be noted.

**Stationary Field Hospitals** form the third line of medical assistance; this is the class of hospital employed along the line of communications. They are hospitals which may be moved, although not supplied with special transport; they are termed "stationary" apparently with reference to the "stations" along the line where they are placed. Thus, like the appointment of the P.M.O., under whom they are, the name is connected with a fixed position. They should not be confounded with station hospitals in garrison towns on a peace establishment, a class of hospitals supplied and equipped on a superior scale.

In selecting sites for these hospitals with respect to their surroundings, water supply, and sanitary condition generally of the locality, it must be considered primarily in relation to the military position, the magazine supply stores, medical and other depôts, rest camps, transport stages, etc. It is necessary to have the site conveniently situated near canals, railways, roads or other means for the transport of sick and wounded. All things should be considered with due regard to the permanency of the position chosen.

It is estimated the maximum number of stationary field hospitals required for an army corps will be eight, but much will depend on the length of the lines and local conditions. They are numbered from the base towards the front. See page 413.

With respect to position and equipment, etc., these hospitals are intermediate between a fully equipped hospital at the base and a field hospital at the front. Stationary field hospitals receive the sick from the field hospitals. They are non-dieted, but they may be partly dieted, and if possible dieted, should the means of supplying them be available. In this class of hospital, when properly dieted, sick and wounded can be treated effectively; but it is impossible—so much depends on local circumstances—to lay down even a general rule as to the class of patient that should be retained under treatment in any one of them, instead of their being passed on towards the base. Each hospital is for 200 patients.

*Establishment.*—One brigade surgeon, four surgeons-major, four surgeons, one Q.M., one warrant officer; total N.C.Os. and men, 75, of whom 11 batmen, one messenger and four washermen, = 16, are from the reserves.

*Tents.*—80 single circular, to accommodate three sick or 15 men in each. Some tents on a stationary field hospital should be set apart for sick officers; two double circular, as operating tents; two single inside circular, as latrine tents; total 84. Where this description of tents are not issued, or building available, 14 large hospital marquees will be issued, which should be stored at the base.

*Equipment.*—All stores and equipment for these hospitals are drawn from the base of operations. 200 non-folding stretchers to be used as bedsteads, or bedsteads, may be supplied when considered necessary. 200 sets of hospital clothing for patients, and 200 grey general service blankets, form portion of their equipment, detailed at length in the Medical and in the Equipment Regulations.

**General Hospital at Base of Operations.**—Dieted 500 beds. This hospital is under the deputy surgeon-general at the base, who is also P.M.O. and sanitary officer. There is one surgeon-major as secretary and registrar, two brigade surgeons for medical and surgical divisions, six surgeons-major, ten surgeons, one Q.M., three warrant officers; N.C.Os. and men, 145, of whom 25 are batmen from the reserves.

Nursing sisters form part of the establishment of these hospitals, and civil assistants from charitable or religious societies are usually employed in these hospitals, which are organized and administered in a manner similar to a general hospital in peace.

**The General Hospital Dépôt** at the base is essentially a military dépôt, under military organization and command, to which men discharged from hospital are sent, and to which men passing through the hospital are attached for military, disciplinary, and administrative purposes, provided the regiment or corps to which they belong is not at the base.

The arms of all men, including those of the M.S.C., sent from the front to the base hospital should pass through the dépôt.

**Hospital Ships.**—The floating hospital accommodation for an army corps consists of 600 beds in three dépôt ships, one for each division, capable of receiving 200 sick. These are called dépôt hospital ships. Each of these ships has on board 400 canvas cots, for use in auxiliary steam transport if required for sick. To each dépôt hospital ship a tender is attached as store ship. There are also relieving ships, capable of accommodating 60 sick, employed for the conveyance of those sick who are invalided to England; and, in addition, despatch vessels, fitted with 30 canvas cots, for the removal of the less severe cases, which may be transported by the ordinary mail-packets or other homeward-bound steamers.

The victualling of these ships is under the Admiralty. The dietary is accounted for in the same manner as in station hospitals (*see* p. 329). The washing is also arranged for by the Admiralty (*see* p. 338).

The medical services—including attendance, medical and surgical equipment, utensils and hospital clothing, but not bedding or ward equipment—are furnished by the War Department. For further particulars, *see* chapter on **Movement of Troops by Sea.**

Hulks, especially when old and dilapidated, are unsuited to afford hospital accommodation. At Suakin an old hulk, the "Underwriter," was taken up by the Medical Department for hospital purposes, but was condemned before occupation. This hulk was purchased for the purpose of being sunk so as to form a landing stage for the plant of the Suakin and Berber railway; it cost 3,000*l*. Possibly this item may have been added to the expenses of the medical services in connection with the expedition.

The establishment of general hospitals at the base, fully equipped and organized in every particular, is a matter of vast importance to an army corps or expeditionary force. These hospitals should be formed at as early a period as possible. Much technical knowledge and labour are required in this organization and construction. All military authorities are satisfied as to the absolute necessity for an efficient medical service in the field. *See pp, 219, 381.*

Although the sick and wounded are evacuated from the field hospitals, still their restoration to the ranks on invaliding from the theatre of war will rest with the staff in the other hospitals. The invaliding of soldiers on service is a matter of the greatest importance; this is a question that might be considered in connection with the employment of civil practitioners. Whatever the future arrangements may be to meet the strain of war, the present M.S. of our army is numerically weak, while its reserves are totally unacquainted with the service and its requirements. Without a practical knowledge of our military hospital system, and the mode of conducting duties within the army, no matter how skilful, energetic, and enthusiastic persons may be, they are comparatively inefficient at starting.

## CHAPTER XIV.

## AMBULANCE, BEARER COMPANY, TRANSPORT, EVACUATION OF SICK AND WOUNDED.

THE object of sanitation is expressed in the adage "Prevention is better than cure." Ambulance occupies an intermediate position between prevention and cure, its object is to assist the fallen rather than to prevent the fall. Even apart from war services, this secondary consideration is the one which seems chiefly to engage the attention of charitable societies. The term ambulance comprises within it more than actual transport; it refers to all other means by which to succour, help, and comfort the sick and wounded, including the medical administration of all duties relating to these matters short of hospital treatment.

Ambulance in the organization of foreign armies embraces within it their moveable field hospitals. These hospitals in our service are only constituted to afford temporary relief, not hospital treatment, properly so called, and this is a matter which is but very imperfectly understood, while beyond our service, under the Geneva Convention, this may involve a serious question, and in all probability, in order to avoid misunderstanding, our organization, or rather nomenclature, will have ultimately to conform to what is adopted by other States under the Convention; therefore our present moveable field hospitals might with advantage be called ambulance hospitals.

Ambulance equipment is protected by the Geneva Convention, and is not subject to the laws of war in the event of capture as the spoils of the enemy, but is regarded as if it were the private property of those in attendance on the wounded. Hospital equipment, on the other hand, irrespective of whether it is in use by sick or wounded, remains subject to the laws of war.

The Geneva flag will be used over hospitals, ambulances, and evacuations. All persons serving under the flag are acknowledged to be neutrals or non-combatants, including the transport of hospitals and sick convoys, as well as the wounded who are *hors de combat*.

Bearer companies are formed with the object of carrying out the system of evacuation of sick; that is to say, by their removal to relieve the fighting line of an army from the encumbrance which would occur by reason of sick and wounded being retained at the front.

The number of bearer companies for an army corps will be one for each brigade = six, and one for each cavalry brigade. Total in the field, eight. They accompany the body of troops to which



they are attached. Each company should be regarded as a tactical unit, and is not intended to be divided in a manner similar to a field hospital, which, for purposes of analogy, I compared with a regiment, which is an administrative unit in our military organization.

A bearer company, according to the Q.R., forms the second or (b) line of medical assistance, the regimental bearers, two men per company, told-off for this purpose, and the M.Os. attached to a regiment or corps, forming the first or (a) line; this extends from the corps to the collecting station formed by the bearer company. Regimental bearers cover the same ground, and pass to the same extent in rear, as the bearers of the bearer company. This may be called the zone of bearer carriage; but the duties of the company as a body extend beyond this, as far as the field hospital, through the first and second line of sick carriage, which is placed at the disposal of the commander of the company. Taken as a whole, this is the first line of medical assistance, as far as the collecting station "stretcher bearer carriage." From collecting station to dressing station, *first line of sick carriage*, where wheeled transport, "ambulance," or other special carriage is to be employed. From dressing station to field hospital, *second line of sick carriage*, not necessarily ambulance or special, where transport wagons, country carts, or other means of conveyance may be employed. A certain proportion of the wheeled transport may be in reserve; those wagons, known as wagons of the second line, are generally made to follow the army corps at a distance of half a day's march, and are brought up only when necessity for their employment arises.

The second line of medical assistance is formed by the field hospitals.

"The land transport of all armies is generally divided into two distinct parts; the first, or *the first line of transport*, is that portion which moves with the army itself. It is provided for the conveyance of baggage, camp equipage, reserve ammunition, ordnance stores, field hospitals, sick and wounded, and supplies and forage for a limited number of days. For this portion, which is intimately connected with the troops, a military organization is absolutely necessary. The permanent transport being the best trained, equipped, and disciplined, is employed with the advanced portion of the troops.

"The other, *the second line of transport*, moves in rear of the active zone of operations; it pushes forward the supplies for the army from the base as far as the most advanced magazines, and is generally out of reach of attack from the enemy. A strictly military organization for this portion would be superfluous, but properly military constituted cadres of officers and N.C.Os. to supervise it and work it with regularity and efficiency are necessary. Army transport of the second line is closely connected with the line of communications service."—*Furse*.

Here we see, within the first line of medical assistance, both the first and second line of sick carriage are employed, embraced within the first line of transport; while the system is good in principle, the nomenclature is defective, and likely to give rise to mistakes. Conveyance intended for the second line of sick carriage may find its way into the second line of transport, and so on.

The mixed transport of the second line employed on the stages between the stationary field hospitals along the line of communications can be utilised for the double purpose of bringing up supplies and stores, and returning sick and wounded towards the base. This class of carriage is not special or held on charge by the Medical Department.

Regimental bearers, bearer companies, ambulance, and sick transport generally, are the means by which the "evacuation" of sick and wounded from the front is effected.

**Bearer Company.**—The duties and organization of bearer companies, in order to fulfil their object, is that of an ambulance corps; although associated with hospitals, their employment is in connection with the removal of sick more than the restoration of health.

Our ambulance system, although, as it were, a branch of the department under the same management, is not an essential part of our war hospital system; it has nothing to say to hospital management, interior economy, or the treatment of sick, beyond a first field dressing, or the immediate wants of the case. On the other hand, the object essentially of hospital treatment is to restore men to the ranks as quickly as possible.

The ambulance system in continental armies, as before mentioned, includes some hospitals in its organization. Ambulance with us, in its relation to field hospitals, means the supply and transport of sick, and to no greater extent does it enter our hospital system.

*The personnel of a bearer company* includes one surgeon-major in command, two surgeons, one Q.M., one sergeant-major, six staff-sergeants and sergeants, six corporals, 48 privates, and one bugler, as well as the officer and men of the A.S.C. attached for transport duties. Of the privates, 32 bearers for the eight stretchers are from the reserves of the corps. The men of the reserves employed in hospitals may be from the militia reserve, from which the five batmen of a bearer company may also be supplied.

*Tents.*—12 single circular for accommodation of personnel, 15 men in each tent; one double circular, as an operating tent; and one inside circular, as a latrine tent = 14.

"The wheeled transport of a bearer company includes ambulance wagons, a surgery wagon, when practicable, store carts,

water carts, etc. The pack transport of a bearer company, on the other hand, includes cacolets and litters, field panniers, etc., borne by mules."

Summary to show a comparison between wheel and pack transport for a bearer company in the field:—

Description of Stores.	Wheel Transport.				Pack Transport.		
	Wagons.	Carts.	Drivers.	Horses.	Drivers.	Mules.	Remarks.
Medical and surgical stores.	1	2	2	4	4	11	At 1 driver to 3 mules.
Baggage and reserve rations.	1	2	2	4	4	12	" "
Supplies	—	1*	1	2	1	2	At 1 driver to 2 mules.
Tents	—	1*	1	2	1	4	At 1 driver to 3 mules.
Ambulance	10	10a	20	40	6	6	a Ambulance carts have only 1 driver and 2 horses each.
Water	—	1*	1	2	1	3	b Depends on the number of additional stretchers ordered.
Spare	—	—	—	—	1	3	N.B.—Details in <i>italics</i> are furnished by A.S.C.
Total	12	17	27	54	12	35	

\* One supply cart, one tent cart, and one water cart are supplied with the 12 wagons to complete the equipment when wagons are used.

The company organization is in sections, of which there are two with four stretchers in each.

The regulations for the instruction of stretcher bearers and bearer companies state—

**In action the Company is divided thus:—**

I. Two stretcher sections, under one surgeon; each section consists of one sergeant and 16 privates.

II. A collecting station, where a sergeant will be posted with a field companion in his charge.

III. The ambulances, to which are attached five corporals and five privates.

IV. A dressing station under the surgeon-major, assisted by:—

1 Surgeon. 1 Sergeant.

Sergeant-Major. 1 Bugler.

Compounder. 1 Corporal.

And 4 privates (1 a cook).

The remainder of the company stay at the dressing station.

The bearers are supplied from the reserve of the Medical Staff, or from the militia reserve.

As a general rule, the disposition of a bearer company (provided with stretchers and wheeled transport) in action will be as follows:—Four bearers will be told-off to a stretcher, two to carry it at a time and two for a relief. Upon the latter men also will devolve the duty of removing the arms, ammunition, and accoutrements of the wounded to the rear, and of carrying the

surgical haversack and water bottle. Every such detachment is called a stretcher detachment; four stretcher detachments constitute a section, which, when practicable, will be placed under the immediate command of a staff-sergeant or sergeant. The bearers of a bearer company are divisible into two sections, each under a N.C.O.; the remaining N.C.Os. and men are intended for duty, either at the collecting or dressing stations, or with the ambulance wagons of the first or second line, etc.

"The two sections of bearers with stretchers and haversacks will be paraded and sent out under one of the M.Os. to succour and collect the wounded; they will bring the wounded to the collecting station, and place them in the ambulances or other sick carriage, returning at once to the scene of action, and taking fresh stretchers with them if necessary; the stretcher parties will not pass in rear of the collecting station."

**Collecting Station.**—"The collecting station will usually be under shelter, but as near the fighting line as is consistent with safety; it will be placed in charge of a staff-sergeant or sergeant, having in his care a field companion and water bottle, and a small reserve of bandages and first dressings to replenish the surgical haversacks of the stretcher bearers.

"Five corporals and five privates will be attached to the ambulances or other sick carriage; these will rendezvous at the collecting station, and as they are loaded with wounded, will move off towards the dressing station, each under charge of one of the corporals or privates. They will deposit the wounded at the dressing station, and return at once to the collecting station. The full number of ambulances and proportion of sick carriage in the first line will always be maintained, and they will never go in rear of the dressing station during an action."

**Dressing Station.**—The dressing station will if possible be out of fire, and advantage will always be taken of a good water supply, and of buildings or other shelter near the scene of action. The M.O. in command will remain there, assisted by a surgeon, the sergeant-major, two sergeants (one as compounder), the bugler, a corporal, and four privates (one of whom should be a cook).

The remainder of the company, *i.e.*, the acting Q.M. sergeant, with two privates employed as cooks for the company, the officers' servants and the supernumerary will be in charge of the baggage and supplies, and will have food ready prepared for the company at the close of an action.

The necessary surgical and medical equipment, medical comforts, and water carts will be assembled at the dressing station, and if no building is available the surgery tent will be pitched. Beef tea and stimulants should be got ready, and every preparation made to succour the wounded as they come in.

As the wounded are dressed they will be placed on the ambulances or other sick carriage of the second line, and taken to the field hospitals.



In mountain or desert warfare the mules carrying the field panniers, etc., and the cacolets and litters will be halted at the dressing station.

The dressing stations will be distinguished during daytime by a red-cross flag, and during the night by a red lantern. Directing red-cross flags will be placed between the collecting and dressing stations, and between the latter and the field hospitals to mark the road.

Lanterns for searching in the dark form part of the equipment of a bearer company and field hospital.

The foregoing instructions, from which this is taken, must necessarily be varied to meet the exigencies of the locality and warfare in which the army is engaged, and according to the need of advancing the collecting and dressing stations on a forward, or of receding them on a retrograde, movement of the troops; but the general principle will always be kept in view of having the collecting and dressing stations at no great distance apart, so as to shorten the journeys of the ambulances of the first line, and bring the wounded within reach of surgical aid as speedily as possible. In some kinds of warfare these stations may be combined.

**The Regulation Field Stretcher** now in use is known as Surgeon-Major Fares' stretcher. Length of poles, 7 ft. 9 ins.; length of canvas, 6 ft.; total width, 1 ft. 11 ins.; height, 6 ins.; weight, 32 lbs.

I have improved field stretchers so that they can be used as escalading ladders. My plan is, underneath the canvas bed of the stretcher, to pass rope steps between the poles, after the manner of the ratlins in the rigging of a ship, and then by fastening the poles of two different stretchers together by means of metal fixings to obtain 15 ft. of ladder. The above stretcher can be easily converted for this purpose.

**The Regulation Ambulance Wagon** is for the conveyance of six or seven wounded persons, two inside on stretchers, two in front and two in rear, with one seat for an attendant. It is worthy of note that the accommodation for two being carried in a recumbent position out of six is typical of the proportion the severely wounded in battle bear to the entire number of wounded for whom carriage should be provided. Generally speaking an ambulance complete may be taken as the basis, subject to variations, on which estimates for evacuation of wounded can be framed. In our service the ambulance wagon is the fixed unit of wheeled carriage transport for sick and wounded. It is a covered spring wagon, the fore carriage to lock under, drawn by two horses. In the old pattern wagon the driver rides the near horse, the new wagon is driven from the box. "A corn locker and a water tank are carried under the body. The locker is accessible from two openings, with lids formed in the bottom of

the body, and will contain three bushels; the tank is fitted with a leather funnel and tube, and will contain nine and a-half gallons; a moveable box is carried on each side, one for wine, the other for tools, small stores, etc. The interior of the wagon is divided by a longitudinal partition. Valises and accoutrements are carried at the head and foot of each stretcher; straps are fixed to the centre of the roof to carry the pillows belonging to the stretchers, and to the front and hind standards, so as to admit of four field stretchers being carried folded, two on each side of the wagon. On the floor under each stretcher are straps for securing rifles."

The weight of an ambulance wagon complete is  $17\frac{1}{2}$  cwt.; tonnage, about  $3\frac{1}{2}$  tons; track of wheels, 5 ft. 2 ins. This gives a weight of transport of, say, 380 lbs., to carry a man with his arms and equipment, weight 200 lbs.

The old pattern ambulance was about 5 cwt. lighter than the new one. For conveyance of the same number of men in it, only five gallons of water were carried in a barrel attached in front of the wagon, and the wagon stretchers could only be used in the wagon, thus requiring the sick to be transferred to them from the field stretchers. The new ambulance accommodates the sick without their removal from the regulation stretcher.

*Water Transport.*—A water cart to hold 108 gallons, drawn by two mules, form part of the equipment of a bearer company. With pack transports three pairs of barricars or breakers are provided to hold five gallons of water each.

**Cacolets and Litters.**—The company is provided with 18 pairs of cacolets, eight for the first line and 10 for the second line in action; also litters 10 pairs, four for the first line and six for the second line in action. When wheeled transport is provided, 10 ambulance wagons complete with six stretchers each are provided, to be employed four in the first line and six in the second line when in action.

A pair of the present regulation litters are said to weigh 106 lbs., a pair of cacolets 56 lbs., not including the pack saddle, the weight of which is when complete 64 lbs.

Cacolets carry men sitting one on either side, facing towards the front. Litters carry men lying down after the same fashion, with the patients' heads to the front, as a mule is best able to bear the weight forward over his shoulder. With camel transport it is difficult in some cases to get the litters level, so the litters must be hooked on to the saddle, in order to get the head of the patient towards the highest level of the incline. To fit the saddles served out to the camels supplied for ambulance at Suakin was no easy matter. Sometimes several saddles had to be tried on before one could be got to fit. If the saddle does not fit, the litter or cacolet will not be carried level, and as the animal moves, they will sway about more or less in all directions, adding a feeling of insecurity to the unrest it causes the patient,

while at the same time the animal is certain to get a sore back. To fit on saddles and have all straps and buckles properly arranged and secured, so as to render such ambulance efficient, takes time. I was able to thus fix about six a day in the desert in addition to my other duties.

The following is a copy of the field state of No. 3 field hospital on the 12th April 1885, the day we marched from near "H" Redoubt to close by the Sandbag Battery, Suakin.

Details.	M.S. and M.S.C.			Transport, etc.			Horses.		Camels.	Mules.	Remarks.
	Officers.	N.C.O. and Men.	Total.	Officers.	N.C.O. and Men.	Total.	Public.	Private.			
Medical Staff -	4	—	4	—	—	—	—	4	—	—	{ No Q.M. or Warrant Officer to act as such. 12 drivers with mules. 46 East Indians. 21 drivers with camels. 10 doolies attached.
Medical Staff Corps	—	39	39	—	—	—	2	—	—	—	
Com. Trans. Corps	—	—	—	—	3	3	1	—	59	22	
Native drivers	—	—	—	—	49	49	—	—	—	—	
Camel ambulance -	—	—	—	—	21	21	—	—	33	—	
Dooli bearers	—	—	—	—	52	52	—	—	—	—	
Totals -	4	39	43	—	125	125	3	4	92	22	

The tents used were East Indian pattern privates' tents, 12 tents for sick. Of the above transport, five camels and five mules were held in reserve to meet casualties among the animals.

The Suakin campaign of 1885 was the first one in which we employed a field hospital to afford accommodation for 100 sick or wounded. The field state shows the camel ambulance attached to the hospital.

The fixed hospital staff and stores of a field hospital, sometimes called "the hospital," should proceed on the same ship, so as to arrive together at the base of operations. See p. 351.

While on board is the time to commence organization. Make out a list of N.C.Os. and men ruled off under the following heads:— Number, rank, name, class of orderly, good conduct badges, passed compounder, school certificate, how usually employed, trade, married or single, address of wife or next of kin, children, and religion required in case of christian burial. By this means, on the way to Suakin, I found among the men appointed to the above hospital that there were nine men who had been employed as cook or assistant cook. Cooking is an important business in a hospital, but not in a field hospital—so many cooks were unnecessary; by trades a druggist, miller, fitter, builder, hammerman, stoker, seaman, saddler, tailor, carman, shepherd, butcher, gardener, printer, and so on, a diversity of talent, almost a man for everything. Even a professional lunatic attendant was among the detachment. All this can be recorded on a half sheet of

paper. In the same way take a note of the arms and equipment in possession of each man. Although equipment is issued in sets, and each man's equipment is found to be complete, it does not follow that the number upon any one article is the same number as that on other articles in the man's possession. Trouble may be avoided by noting each number; your equipment cannot then get mixed or go astray; and without searching among the men you can know at once any article belonging to your detachment.

While on board lists of documents should be prepared. All documents connected with pay, clothing, and equipment of men, M.S.C., proceeding to the front, will be taken over by the Q.M. appointed for the purpose on behalf of the P.M.O. at the base. The regimental documents of all men M.S.C. are taken charge of by the registrar of the general hospital at the base. During the voyage men should be instructed, and prior to disembarkation the hospital staff should be appointed to their different duties. In selecting a N.C.O. for a post it may not unfrequently be found that those who are most talkative, and apparently anxious to please, are less thoughtful and earnest than others, and the least to be relied upon.

It would be a great matter, in order to obtain uniformity of action in the field and elsewhere, if the N.C.Os. of the M.S.C. were circulated a little more within the districts; frequently men get detached in small hospitals or other billets and remain there for years; they get into a way of their own of doing things; such acquired habits by no means facilitate the systematic execution of orders which are so essentially necessary for efficiency. A recent order by the D.G. provides that first-class staff sergeants are to be employed as wardmasters, and not as clerks in head-quarter offices in districts. Three years should be the limit for any N.C.O. to remain as the senior employed in a station hospital.

In the field, be careful to keep a record of the numbers on your transport animals, whether they be camels or mules, otherwise when your transport is detached on convoy or other duty (which it ought not to be), to other field hospitals or bearer companies, you are pretty certain to get in return some lame and sore-backed animals. The M.O. in charge is accountable for any transport he receives, and the P.M.O. is responsible that the field hospitals in reserve are in an efficient state, and capable of moving to replace any hospital at the front which may be disabled. Take the numbers of your drivers; write the number of each mule on its saddle, and also on each pannier which form its load; keep the panniers of each load together at the guard tent; adopt the same plan with camel cacolets and litters. These should be placed on the ground in the camel lines, in rear of the animal to which they belong, while it is lying down for the night. I tried appointing a driver to two camels; thus, driver No. 272 had his number on camel 8,329 and 8,332; he



was told-off to them, and they to him, but this would not work; they got mixed, and responsibility could not be fixed; but in the case of mules it answered to a certain extent.

In accordance with the organization of field hospitals, all medical and surgical equipment for pack transport is made up in duplicate packages or pairs, suitable for mule carriage; the weight of each load varies from 104 to 180 lbs.; thus, two medicine field panniers or two medicine reserve field panniers weigh 180 lbs.; two material field panniers, two material reserve field panniers, or two special surgical field panniers 160 lbs.; two field filters, Maignen's, 112 lbs.; two field fracture boxes 104 lbs., and so on. As regards this special equipment, each two boxes of equipment composing a set will balance each other and form a compact load equal in size and bulk, yet they should not be carried in this way, for if you lose a mule with his load, the hospital may be more or less disabled on account of the total loss of one class of equipment; thus, the loads formed of this special equipment should be made up and balanced almost regardless of appearances. A field medical companion, which weighs 11 lbs., strapped on to a material pannier, will balance a field medical pannier, and so on.

It is only after receiving over equipment that you can commence a practical organization of the materials placed at your disposal, but the appointments of the fixed establishment of the hospital can be made during the voyage to the base of operations. One delay and difficulty experienced at Suakin was due to the fact of not being informed what the equipment would be, which is now detailed, so far as it can be, in the regulations.

By contrast with the military unit, always kept intact, a field hospital is a "creation," or certainly the nearest approach to it of anything in the service; beyond a mere name it does not exist in substance or in fact, and out of Europe no fixed establishment can be laid down for it on paper. It must be built up on the principles of our army hospital organization. Each hospital unit, when so built up, to attain efficiency should be kept together as much as possible. Administrative officers should be mindful of the responsibility and great amount of labour that frequently attends the accomplishment of this task; few things tend more to upset arrangements on service, than the frequent changing of a hospital staff, whether medical or subordinate. Just as you are beginning to know the capabilities of your staff, to find that they are ordered away without a moment's notice, is trying; it increases the work, and is detrimental to the efficiency of the hospital.

I have established and disestablished six hospitals in Egypt without the aid of a Q.M., and although fortunate enough to account for every article of equipment, yet it by no means follows that Q.Ms. are not of use; on the contrary, they should relieve a M.O. of a great deal of trouble and anxiety in connec-

tion with transport stores and equipment. A Q.M. or warrant officer should form part of the establishment of a field hospital on service, that is to say, they should be present and effective, and not exist only on paper.

**Transport.**—From the foregoing it may be seen how extensively a knowledge of transport, both general and special, are connected with the duties of M.Os. It is a narrow and incorrect view of the subject to regard the connection of the medical services with transport merely in relation to ambulance and sick carriage.

Transport is a very important subject in connection with hospitals in the field, bearer companies, and the evacuation of sick and wounded. According to our present organization, the Medical Department, irrespective of ambulance for the carriage of sick, are necessarily accountable, either directly or indirectly, for a considerable amount of transport. M.Os. should therefore have a knowledge of the general principles of transport organization on service, and the capabilities of different descriptions of transport; a reference to military opinion on this subject is preferred to a strictly medical one.

Having before stated Colonel Furse's remarks as to the necessity for the transport required by the Medical Department being placed at its disposal (*see* p. 139), it may be further added in addition to what is there stated, in case of a hasty retreat, should the transport not be placed at the entire disposal of the M.O. in charge, the wounded will in all probability have to be abandoned to the enemy before the *demand* for carriage on the A.S.C. is complied with. Major De Cosson, in a lecture delivered last March at the United Service Institution on the subject of transport in the Soudan, said—"All officers, whether combatant or not, should carefully study both the general organization of transport and the working capabilities of the various classes of transport that can be employed; because it is only by doing that they will be able to form a just estimate of what can and cannot be done with the resources at their command in the field."

Military land transport in the field is divided into two distinct parts—regimental and general. The first is specially allotted to corps, in order to complete the unit in this respect and render it independently mobile; the C.O. is responsible for its efficiency. It forms part of the war establishment of a battalion or regiment. A subaltern officer of the corps will be put in charge of this transport, men, horses, and equipment.

The transport for bearer companies and field hospitals is only attached from the special transport of the army; this is a weak point.

The transport of an army is divided into general and special, without reference to its employment on the first or second line, or in reserve.

The first line of transport is employed within the zone of operations; the second extends along the line of communication. The transport of the first line is partly regimental and departmental, placed in charge and under the orders of the C.Os. of the different units to which it is attached. This includes special carriage, such as ambulance. Thus organized on the principle of decentralization, the calls on the senior transport officer in the field are less numerous than they otherwise would be, while he is relieved of much anxiety and responsibility. The general transport of the first line brings up supplies and stores from the advanced dépôt and magazine. This transport should be composed, as far as possible, of the regulation transport of the army, and have an essentially military organization of the most reliable material. It would never do, while in action, to be abandoned by your transport.

The transport of the second line may be mixed, army regulation and auxiliary or local, made up of carriage obtained by purchase, hire, regulation, or contract. Although desirable, it is not necessary that this class of transport should have a military organization. The contract system enters so completely into our military organization, or is dovetailed so with it, that it is scarcely to be expected we could maintain our army in the field without it. This fact must be recognised, as it makes a vast difference in the arrangements for supply and transport with us, and what is ordered by the great military powers of Europe.

**Wheel Transport.**—As two horses can draw at least as much as eight pack animals can carry, this alone will show what a saving of animals, drivers' food, and forage can be obtained by the use of wheel transport in all countries which are intersected by good roads. In such countries this description of transport will be found preferable to any other, and will tend largely to reduce the length of the transport train of an army. Take, for example, a string of camels on the march; the length of a camel and interval between each two animals is reckoned at from five to six yards; three such animals will take more room in length than a four-horse wagon, yet carrying less than half of its load. The difficulties of the transport, the safety of the train, and the time occupied in transit, increase with the length of the train. It is above all necessary to reduce the time occupied by the train in transit, for the longer it takes to go from camp to camp, the longer the troops remain without their necessaries, and the less time the animals will have to feed and rest. This latter is a point of great importance. Carts and wagons are besides more orderly on a road than long strings of pack animals, and though subject to breakdowns, and requiring good roads, come in very useful for the purposes of defence. The efficiency of the transport will greatly depend on the nature and state of the line of communications; as long as there are good roads, wheel transport should be used, pack transport only being employed where carriages cannot move,—*Furse*,

The draught loads for regimental transport have been taken as follows (including wagon and all its stores, etc.) :—

For two horses accompanying infantry on the march (such as in an ammunition cart), 9 cwt. per horse.

For two horses in the baggage column, 11 cwt. per horse.

For four horses in the baggage column, 10 cwt. per horse.

General Sherman reckons the nett load of a six-mule American army wagon at 3,000 lbs., which will be seen to approach very close to the load of our general service wagon. He says . . .  
 “An ordinary army wagon drawn by six mules may be counted on to carry 3,000 lbs. nett, equal to the food of a full regiment for one day; by driving along beef cattle, a commissary may safely count the contents of one wagon as sufficient for two days’ food for a regiment of 1,000 men.”

Wagons drawn by four mules are good for a load of 2,240 lbs., with two mules of 850 lbs., and the Maltese cart drawn by one mule can carry a load of from 450 to 500 lbs. The average amount carried in a cart with two bullocks is 850 lbs., in one with four bullocks about 1,600 lbs.

Including an interval of four yards between each two wagons, in column of route, a two-horse wagon will occupy 12 yards, a four-horse one 16 yards, a six-horse one 20 yards.

*In Column of Route.*—Infantry in fours and cavalry in sections are computed to occupy a road as follows :—Cavalry to twice the extent of their front in line, and infantry to an equal extent, or one yard of road for each cavalry, and half yard for each infantry soldier; 20 yards is allowed for a gun or wagon. A bearer company or field hospital will require on the march 300 yards of road.

*Marching area* refers to the extent of ground covered by a column; its front or breadth and depth may be taken as a rule to be of equal length.

Our latest experiences of wheeled transport has been in South Africa, where it was much used on long lines of communication. Ox and mule wagons employed there were able to march 12 miles a day, more or less, according to circumstances; but the mule can do a few miles more than the ox, if kept in good condition, and corn-fed mules can travel 20 or 25 miles a day.

Mixed wheeled transport is required where the natural features of the country vary, and the roads are of different descriptions. The class of draught animal must also vary according to the conditions of climate and description of work to be performed. In South Africa disease among the horses was very prevalent and fatal, while the mortality among mules was only eight per cent. Wherever pasture failed, the ox failed also; so they are not to be depended on for military purposes. During the dry season, when the roads are in good order, these cattle are unfit for work, and when the roads are cut up by rains, and water-courses are swollen, they are fit for the yoke. The foregoing is chiefly gathered from Colonel Furse’s work and the regulations relating to transport.



The following table shows the distinguishing marks on stores and packages sent to an army in the field. From Major Burn's notes on Transport and on Camel Corps :—

Mark.		Class of Stores.
Balls -	{ One blue ball -	Ordnance carriages, shot of all kinds, empty shells, and general stores for field service.
	{ Two blue balls -	Similar stores for siege service.
	{ One red ball -	Small arms, accoutrements, and the implements or material for their repair.
Crosses -	{ One red cross -	Medicines and medical instruments.
	{ One black cross -	Medical comforts.
	{ Two black crosses -	Hospital and barrack stores.
Diamonds -	Two red diamonds {	Ammunition for artillery or small arms, including live shells and combustible stores.
Heart -	One black heart -	Clothing and necessaries.
Horse-shoes {	One black horse-shoe -	Harness and saddlery, pack-saddles included.
	Two black horse-shoes -	
	Two black horse-shoes -	
Squares -	{ One black square -	Wagons and carts for transport of stores.
	{ Two black squares -	Intrenching tools, etc.
Triangles -	{ One red triangle -	Materials for hutting or building (except nails).
	{ Two black triangles -	Miscellaneous stores.
		Camping equipage (except intrenching tools and pack-saddles).
Trefoil -	{ One green trefoil or club -	Food, forage, fuel, and light.

**Wheel Ambulance.**—The following list of requirements for wheeled ambulance vehicles is from Professor Longmore's "Treatise on the Transport of Sick and Wounded Troops":—

There are certain necessary qualities in conveyances moved by draught power intended for the carriage of sick and wounded men, and certain provisions necessary to ensure their efficiency, that are common to all such vehicles whatever may be their individual forms. These may be enumerated and considered with advantage before noting the special construction of particular carriages. They are the following :—

1. The conveyance must be fitted with proper springs or other contrivances in order to prevent the force of the concussions, which the vehicle will be subjected to in travelling, from being directly communicated to the patients within the conveyance.

2. The conveyance should be fitted to carry the greatest number of sick or wounded that can be got along by the amount of draught power employed, consistently with due provision for all the other requisites of an ambulance vehicle.

3. Provision must be made for the conveyance of men in a recumbent as well as in a sitting position.

4. The carriage must be capable of being packed up for transportation on board ship, and capable of being readily put together again for use on landing. This more particularly applies to carriages in the British service.

5. Provision must be made for repairing parts which are liable to be damaged, and replacing those which may be lost, especially

such as are essential to the efficiency of the whole conveyance, as the wheels, for example.

6. The strength of the vehicle must be adequate to meet the shocks it will be liable to in campaigning, but this power of resistance must not be obtained by adding to its weight to such an extent as to unfit it when fully loaded for the draught, and continued exertion over all kinds of roads, of the number of animals it is intended to be drawn by. Durability and lightness of draught must be made mutually consistent.

7. Provision must be made for the carriage of water, a few stretchers, means of light, and such surgical articles and restoratives as the wants of wounded men in the field usually demand.

8. The vehicle should be provided with the means of protecting those who may be carried in it from rain, dust, and the glare of the sun.

9. There must be a free circulation of air in the vehicle, especially in that part where the recumbent patients are placed.

10. Arrangements must be adopted so that patients may be lifted into and removed from the carriage with ease to the bearers, and without risk of injury to the patients.

11. There should be ready means of communication between the sick and the attendants, or others, who are in charge of them.

12. A place should be allotted for the knapsacks, arms, and accoutrements of the wounded men who are carried in the conveyances.

In the absence of ambulance accommodation constructed so as to fulfil the above requirements, this list may be useful to the M.O. on service, as it embraces nearly all matters which should be considered in improvising, reconstructing, or fitting up whatever transport may be available.

Good as our present ambulance wagon is, it is impossible to construct one suitable for all climates and conditions, and the same difficulty has been felt with respect to an apparently more simple construction—our general service wagon.

**Pack Transport.**—Pack animals for transport are used in mountainous countries, roadless plains or jungles. Whenever used (either for general purposes or for special purposes) in lieu of ambulance, they must fulfil certain conditions to be efficient. Sick carriage, by reason of the nature and importance of the service on which these animals are employed, should be of a standard above that for ordinary pack work; consequently a selection should be made from among pack animals for sick carriage, or a better description obtained by special purchase; but this would only be necessary in case of the permanent carriage required by the Medical Department.

It is the duty of the administrative M.Os. of divisions, or of the line of communication, in evacuating sick or wounded towards the base, to specify the amount and kind of sick carriage required for their transport (*M.R.*). Thus these officers must

have a general knowledge of the capabilities of the different classes of pack animals available, as well as a knowledge of the most suitable for this special duty. For instance, a choice may be offered between camels and mules; or, again, a M.O. may be given the option of selecting animals for his purpose. Now, should such an offer be made, it would be well if he were able to take advantage of it, at least, to a considerable extent.

All estimates for transport must be framed with regard to what an individual animal is capable of bearing and doing.

A fair average load for donkeys is		-	100 lbs.
"	"	pack bullocks is	160 "
"	"	horses and mules is	160 to 200 lbs.
"	"	camels is	from 320 " 400 "
"	"	elephants is	" 800 " 1,200 "

A pack horse or mule, with interval between each two animals, occupies in column of route four yards, a camel six yards.

Mules have a habit of gnawing anything they can seize excepting metal. Chains should be used instead of head ropes.

If a mule is seen to be raising his lips and twitching his nose and mouth, his load is improperly adjusted and is galling him.

Pack transport should never be resorted to when there is any other kind of transport available, for it is the most expensive description of transport, because packing is very laborious, and with the best packing a large number of animals will be always incapacitated for work. For horses and mules, the weight to be carried is generally laid down at 200 lbs., pack saddle included; that is to say, 150 to 160 lbs. is a fair average load for pack animals doing continuous work on bad roads in a poor country; yet pack transport must, as a rule, form an important part of transport in all armies. They can follow an army over any country, and have the advantage over wheeled transport of not blocking the roads, as is frequently the case by the breaking down of some wagons in a military train.

The animals used for pack transport are horses, ponies, mules, donkeys, camels, bullocks, and elephants. Mules are the most valuable animals for pack transport. A mule should be 14 hands high, girth 67 ins., back straight from withers to croup. Neither of these points should be high; better have the back arched than hollow. Cow-hocks are not objectionable, provided they are sound. For carrying sick or wounded a short step is preferable to a long one, which causes the body of the animal to sway and the back to oscillate as he goes along. They should be well bred, in appearance more approaching the horse than the donkey. For military purposes the age should be from five to ten years. At three years old a mule is said to be in a worse condition than at any other period of his life, and most liable to contract disease. At four the teeth and tushes will appear, as in the horse, but do not come so quickly. While with most animals the age can be known by the teeth and horns, with this hybrid the length of the tail appears to indicate his age.

"At the age of two years the tail reaches to the hocks, at three to half-way down the lower part of the legs, and at four to its full length; by these means the age of the *muleto* can be easily estimated without looking into the mouth.

"Big mules are inconvenient to load, difficult to keep in condition, and frequently weak in their limbs, especially the lower part of the leg. A mule affords very safe carriage for sick along bad roads, is capable of bearing fatigue, is not so restive as the horse: his skin being harder and less sensitive, renders him capable of resisting better exposure to the sun and rain and the pressure of his load; he also requires less grooming and attention.

"In selecting mules for purchase, look for fine appearance, broad chest, strong neck, bright eye, fine legs, a moderate sized barrel, good length between the point of the shoulders and the withers, large hocks and knees. Reject narrow chested and big bellied, the latter are weak, and coarse feeders.

"A loaded mule will walk a little over three miles an hour. The same pace should be maintained throughout, for either trotting or slow moving with long halts exhausts and injures the animal. His gait is slow moving down hill, quick up hill.

"Mules are gregarious, and follow their leader without much difficulty after a few days marching, hence it has been found that driving mules answers better than leading, particularly on bad roads and mountain tracks; the animals, if loose, will follow the leading one and the sound of his bell more freely than when tied head to tail together in batches."—*Furse*.

Horse mules are stronger than geldings, which are quieter, not so enduring, of slower movements, and less agile than mares, which on the whole should be preferred for sick carriage; moreover there are certain diseases which occur in the male animal from which they are exempt. The best mules that I have ever seen are those from Kentucky.

**Pack Ambulance.**—Although mules for regimental transport can be employed for the conveyance of reserve ammunition, they are timid animals, easily frightened when not accustomed to fire and the noise of cannon.

With regard to their position when employed with a bearer company for the conveyance of wounded, Longmore says—"But it may be here noticed, as a general rule, that no conveyances borne by animals are capable of being employed nearer to a field of action than the place which has been fixed upon for the first line of surgical assistance. The steadiest and most practised mules would be rendered too restive by the noise of musketry and cannon close at hand to allow wounded men to be laid upon the litters borne by them without the greatest difficulty and danger, even if other circumstances rendered their presence on such occasions admissible. But stationed at the first line of aid, this class of conveyances is capable of affording very efficient help. As fast as men wounded in the upper



extremities, who have been able to make their own escape from the field of action to the place of surgical aid, and men more helplessly wounded, who have been fortunate enough to have had the opportunity of being carried away on stretchers, receive their first dressings, so fast they can be placed on mule cacolets and litters, or other such conveyances, and be removed to the field hospitals, wherever they may be situated. After a combat has ceased, the animals employed in bearing litters can not only be taken close to the wounded who remain lying on an open field, but often can be led to situations which no wheeled conveyance could approach, and in which even bearers would find it difficult to move along with patients carried on stretchers."

With respect to the capabilities of mules as a means of conveyance of sick and wounded on cacolets or litters, Colonel Furse remarks—"The strength of few mules is equal to the heavy weight they would have to carry, for we find the weight of the pack-saddle, bridle, litter, and palliase is given at 167 lbs.; and, even if reduced to 100 lbs., the weight of the equipment, with that of two men taken at 10 stone each, would amount to 330 lbs., and this is a very severe load for a mule at any time, but particularly when travelling over a rough country. For short distances, or for only a portion of a march, this description of sick transport may be of use, but we doubt if it can be ever made available for a continuous movement between the front and the base for serious cases.

"Mules are very suitable for sick transport as pack animals only when specially trained; they are preferable to horses, being smaller, more surefooted, and having a shorter step; they are also less restive than horses under the pressure of heavy weights. For hospital service they should be specially selected, animals of sufficient docility and strength only being used."

**Camels** are more used in India and in desert countries than any other animal for military transport purposes. In cold and rocky countries the Bactarian camel is quite at home, and owing to the peculiar structure of his foot, and being surefooted, is well suited for employment in mountainous districts.

*Capabilities of a Camel for Transport.*—A camel marches from two to two and a half miles an hour for eight hours a day, carrying 300 lbs.; if worked beyond this he must have, after every eight days consecutive marching, an equivalent of rest to compensate for overwork. Camels should not be weighted up to the last straw; the loads should be of a uniform weight, estimated more in accordance with the carrying power of the weakest than the strongest animals. In a mixed team of Berbera and Indian camels, should some of the latter get knocked up on the road, the Berbera camels, which are much weaker animals, in case the loads were not all equally adjusted, could not bring on the loads of the others. If the loads are equal, there is no chance of a camel getting a wrong load, which might cause an interruption and delay on the road. The loss of carrying power—the

result of animals being insufficiently weighted—can be made up subsequently, as the stronger among them will be available for odd jobs about camp, wood or water carrying, etc., or extra convoy duty in case of pressure, while at the same time those which are exhausted can rest. The same applies to all pack animals, but the camel when over-fatigued has very little recuperative power. From five to ten per cent. of pack animals should be retained in reserve with each section of transport to prevent delay in case of any breakdown on the march; an army operating in a barbarous territory could not subsist were it to outmarch its supply transport. Sometimes it may be found expedient to work animals until completely used up and exhausted.

**Camel Transport of Tents.**—East Indian pattern privates' tent to accommodate men should be packed as follows for camel transport:—

					ft.	ins.
Tent	{	Length	-	-	-	9 0
		Breadth	-	-	-	2 4
		Thickness	-	-	-	2 0
Kanauts	{	Length	-	-	-	5 10
		Breadth	-	-	-	1 6
		Thickness	-	-	-	1 6
Tent poles, length		-	-	-	-	13 4
Ridge „ „		-	-	-	-	6 5
Side „ „ Door, length		-	-	-	-	6 4

Peg bags, 3' x 2' 6" x 1' 10" when full and doubled up.

Weight of tents of different patterns used in India are as follows, viz.:—

	(Maunds).	(Seers).
Officers' mess tent complete, with pegs	- 32	36
Officers' single pole	- 20	16
Officers' hill tent	- 8	15
Latrine tent	- 2	15
European Privates', N.P.	- 11	2½
Staff Sergeants'	- 6	1
Sepoy tents of two Poles	- 6	20
Bell tent, double	- 1	10
„ single	- 0	35

Field tent, Commanding Officer's, 120 lbs.

„ Officer's, 80 lbs.

The maund on all railways is reckoned as an equivalent to 40 seers or 82½ lbs., and the equivalent to one ton is reckoned as 27 maunds. With respect to these tents see p. 399.

Where the country is suitable for camels, they are the cheapest of pack transport; they are most usefully employed along the line of communications.

**Camel Ambulance.**—Camel kajawahs or camel doolies have long been used in India for the carriage of sick and wounded. Baron Larrey employed camel litters in Syria when with Bonaparte; kajawahs were also used for sick transport with the Candahar column during the last Afghan war, when the doolie-bearers got ill.

Professor Longmore makes the following remarks with respect to the use of camels for ambulance purposes—"The special objection as regards the use of these animals, at least the ordinary class of them, for conveying sick and wounded, is their peculiar mode of progression. The camel, in walking, at each step raises the two legs on the same side of the body, not absolutely at the same instant, but one so immediately after the other that they appear to be both lifted up together, and the repetition of this action, first on one side then on the other, causes an alternate depression and elevation of the corresponding sides of its body. This up-and-down movement of the two sides of the animal becomes the source of considerable fatigue to a rider, especially if he is not accustomed to the motion. It is not so much felt, however, when a person is carried in a well-balanced conveyance, confined to one side of the animal, as it is by a person sitting on the animal's back; but still it is usually felt sufficiently to be a source of inconvenience to an invalid."

"Another disadvantage, as regards the use of these animals for ambulance transport, is the waste of carrying power when applied to sick or wounded requiring to lie down; for while the camel can carry as much as two or three ordinary mules when carrying stores, none of the camel ambulance conveyances hitherto constructed have enabled the animal to carry more sick in a recumbent position than would be the burden of one mule. This, however, hardly applies to the case of patients who are able to sit up, for some conveyances are so arranged that four patients can be carried sitting; and even when carrying litters, the loss is in some measure compensated by the fact of the animal eating less than would be eaten by two mules, and by his thriving on coarser herbs, as coarse, indeed, as those eaten by the ass. On the whole, however, camels must be regarded as animals only to be used for ambulance purposes in countries where horses or mules are not procurable, or not suitable on account of the peculiar features of the country—whether as regards its soil or nature of its vegetation—through which it is necessary for the sick to be transported, and where, moreover, draught carriage is not admissible. There is economy as regards labour and cost, and gain as regards speed, when the use of camel conveyances is compared with the employment of doolies and dooley-bearers; but nearly all the advantages to the patients which exclusively appertain to this latter mode of carriage, and which have been fully described in a former part of this treatise, are unavoidably sacrificed when carriages borne by camels are employed."

The following is from my report on the camel ambulance of which I had charge during the Suakin expedition, 1885:—

"Surgeon-Major W. E. Riordan, in medical charge of No. 3 field hospital, writes:—

"The camel ambulance attached to the hospital consisted of 13 pairs of litters and 44 pairs of cacolets. The camel cacolets consist of a pack saddle, and on either side a jointed or hinged

seat on a strong iron frame, padded, entire weight 112 lbs. The patient is secured in the seat by means of leather straps; he can only travel in a sitting posture. Improvements might be made in the cacolet by which the patient's position could be altered according to circumstances. These cacolets, when fully developed, will be a most efficient means of conveying sick and wounded in countries suitable for camel transport. The pack saddles of the cacolet are of an universal pattern, but not so the backs of the camels on which they are placed; in fact, the shape of a camel varies much—more so than any other beast of burden; and to have the ambulance efficient much time should be spent in fitting the pack saddles to which the cacolets are attached. This should be done at the time of issue. One great advantage of the cacolet fittings is that the camel having them on is at the same time available for carrying a load—water, tents, etc.

“The present camel litters are unserviceable as means of transport for sick and wounded. They are attached on either side of a pack saddle of the same pattern as that used for a cacolet, but they stand too far out from the animal's side, and the majority of camels, some more than others, give a swaying or pitching motion to the litters, so as to have the same sickening effect as caused by the rolling of a ship at sea. It is such as to disturb a fracture or bring on hemorrhage from a wounded lung.

“Camels, especially when alarmed, are likely to crowd together, and when weakly constituted contrivances are projecting from their sides they get knocked together, broken, or entangled, and so the patients may come to grief. Moreover, in these litters persons on foot cannot afford assistance (owing to the height of the beast), such as might be done in the case of mule litters were an attendant walking alongside. The motion, while the animal is getting up or kneeling down, is very trying indeed to a helpless patient. This is more felt, owing to the position of the occupant, in a litter than in a cacolet. The framework is too flimsy, and the bed of the litter is too broad; this gives a feeling of insecurity, and alarms the patient. The hood is too near the face of the individual carried to allow a free current of air.

“The means of securing the joints with iron pins, which are frequently lost, is imperfect. These pins are attached by cords, which get cut in the hinges.”—*Army Medical Department Report* for the year 1884.

**Evacuation.**—The evacuation of sick and wounded, although usually treated of collectively, and combined in the same paragraphs of regulations in which reference is made to the subject, are matters which must be considered separately. One is a medical subject and the other surgical. But it is not a mere professional or technical distinction that enters into consideration; it is the necessity for separating along the line of communication the medical from the surgical cases—the means to be adopted for keeping apart the diseased and the wounded while traversing the same line of country—that must be con-



sidered. The two disabilities, wounds and disease, which necessitate evacuation are wide apart in cause of origin and their nature. Furthermore, the recently wounded must be kept apart as much as possible from those who have been some time under treatment. While with respect to the sick, patients suffering from certain classes of disease should not be mixed with others, and may in some instances require to be completely isolated and kept away from the line of communications.

**Railways.**—Colonel Furse says—“M.Os. have a just claim to direct every establishment connected with the treatment of the sick, they being fully cognizant of the technical requirements of a service whose sole aim is to cure sufferers from sickness or wounds. A M.O. should, therefore, be in sole charge of every ambulance train, for he will be the best judge of what sick can be safely conveyed, he can best distribute them in the carriages with reference to their cases, and can regulate them according as it becomes necessary in transit. No persons should be employed in these trains but those who possess a fair knowledge of the cares to be bestowed on the sick and wounded, all people who do not possess this knowledge can only be in the way; even the employment of female nurses appears to be objected to, M.Os. recommending their employment to be restricted entirely to fixed hospitals.

“The arrangements for the removal of the sick by rail, or by other means, come within the province of the surgeon-general of the line of communications. Being in telegraphic communication with the M.Os. in charge of hospitals, who, from time to time will report the number of patients in their charge, showing the number whose removal can be attended without danger, he will be aware of the number ready for removal, and of these also of the number that require to be carried in a recumbent position. He will then be able to inform the line of communications staff of the number and description of carriages required, of the locality where the trains should proceed to pick up the patients, and of their ultimate destination.”

It is the duty of the M.O. in charge of a field hospital to decide who are to be returned to the ranks as fit to serve, or who are incapable of serving. These latter are sent for treatment to some stationary hospital along the line of communication. With respect to this duty the position of the M.O. on service is by no means an enviable one. When the sick come crowding in there is but little time or opportunity left to ascertain the true character of a disease complained of. Should the man be sent to hospital, and it subsequently transpires that there was no positive need for his being evacuated, the G.O.C. may consider that the M.S. are unnecessarily invaliding the army. On the other hand, in the event of a man being returned to the ranks as fit to serve, he may, in such a case, so far gain the sympathy of his C.O. as to be brought up in evidence against the M.S. at the expiration of the war. See pp. 31, 270.

As a rule sick carriage should be provided for 10 per cent. of the entire force. The ratio of wounded to troops engaged is about 1 to 9.

On an average the ratio of killed to wounded in battle is as 1 to 5, more or less, according to circumstances, and the proportion of killed to those who die of disease is about the same.

During a battle some brigades or divisions will be more hotly engaged than others, and the wounded will be chiefly centered around some decisive spots, which are either known to the G.O.C. before the action, or developed during the engagement. Administrative M.Os. must be mindful of this, and make all suitable arrangements beforehand for an evacuation, but to enable them to do so, all necessary information should be supplied by the general or his staff.

Colonel Furse says—"The importance of a proper and sufficient organization of the personnel and matériel of the medical service in our wars, generally carried out in unhealthy climates, does not require to be mentioned. If much of the success of every campaign depends on the preservation of the health of the troops, how much greater must be the need of providing against the effects of climates so injurious to the constitutions of Europeans. Not only a personnel in proportion to the troops for immediate attendance is required, but M.Os. for the communication posts and the hospitals, both on the line of communications and at the base. Of the medical personnel it will be as well to consider one-tenth generally unavailable through sickness; a reserve therefore will always be needed."

"Evacuations of sick demand to be effected with judgment, not to aggravate the state of the wounded by too early a removal, and, on the other hand, not to remove those who in a few days might rejoin their corps. Where there are no suitable means of transport, evacuations of sick and wounded in great numbers will be inexpedient, owing to the exposure which the patients would have to endure. Country carts for this purpose are bad, as they afford no protection from cold, wet, and heat, and cause a large amount of suffering from want of good springs to deaden the jolting.

"When it is possible to make a proper selection of the patients to be removed, retaining only the most severe cases for local treatment, many lives may be saved. In making a selection the sick and wounded should be divided into two classes.

"1st. Those who should remain in the hospitals on the spot or quite close at hand.

"2nd. Those who can be removed to hospitals at a distance.

"Under the first head should be included men of three different classes.

"(a.) All very serious cases which are likely to be only aggravated by moving.

"(b.) All patients suffering from contagious diseases, who should not travel, and who should be treated in secluded hospitals.

"(c.) Those who have received only slight wounds, or who are suffering under a temporary indisposition, and who will be fit to return to duty in a few days.

"Under the second head should be included —

"(a.) All those whose recovery will demand a fortnight or more, where no risk is run of aggravating their cases by removal.

"(b.) All those who, treated at first on the spot, are found to be in a fair road to recovery, whose cure is considered as near, and who can stand travelling."

"The amount of carriage required for the removal of the sick and wounded is difficult to estimate. Dr. Gordon considers that transport for wounded in a campaign should be provided for 12 or 15 per cent. Dr. Millangan calculates that at the commencement of an active campaign one-tenth of the army requires hospital treatment, and one-fifth requires subsequent removal to the rear during its progress. Dr. Longmore calculates transport at the rate of 5 per cent. of the combatant force as required at starting. However, all these and other calculations are only approximate, for the circumstances are always varying, and the only sensible plan is to have a considerable reserve always prepared and ready for use.

"To be able to form a pretty accurate estimate of the carriage required for removing the wounded, the average ratio of those requiring to be carried in a recumbent position must be first ascertained. Dr. Longmore shows in his tables, prepared on returns furnished after the Crimean, New Zealand, and American wars, that this average amounted to one out of every three wounded men."

A further reference to this subject by M. Morache, of the French army, may be found in Col. Furse's work on "Military Transport."

Of the wounded in war one in three will require to be moved in a recumbent position. This is the proportion our ambulance is constructed to accommodate. Thus, the wounded may be considered with respect to their transport as divided into two classes, namely, those who will require for their removal lying-down accommodation, and those who will not.

Wounds received in action have been classified with reference to the nature of the injury, its position, and degree of severity. Wounds are thus tabulated in Dr. Longmore's "Treatise on Ambulance," to which the reader is referred for further information on this important question of sick transport. Tickets on the wounded may afford some information as to the transport required.

"M. Scribe, the chief of the Medical Department of the French army in the Crimea, in his observations on the medical history of the war, made a division of the wounds inflicted according to their degrees of gravity; and he showed that 'very severe wounds, calling, or not, for the removal of a limb,' gave a ratio of 1 in 3·1, which indicates a very similar result to that arrived at

in the following tables. M. Scrive divided the wounds into four degrees of gravity, their total number being 43,044. Of these 7,507, or 1 in 5·7, were fatal on the field; 13,284, or 1 in 3·3, were slight; 8,317, or 1 in 5·1, were of medium severity; and 13,936, or 1 in 3·1, were very severe.”—*Longmore*.

From other sources, it appears, in the Crimean war the number of men who lost their lives in the French army was 95,615, of whom only 10,240 perished at the hands of the enemy.

The following will show that the conditions of modern warfare may probably change the relative proportions previously found to exist between the numbers of sick and wounded.

M. Morache, chief of the Medical Staff, French army, in his “Military Hygiene,” gives the following figures in connection with the sick and wounded in the two armies engaged in the Franco-German war, 1870–71:—

German army—Total wounded admitted to hospital, 127,867. Out of this number 8·4 per cent. died—the smallest proportion ever recorded in a great war. Killed in action, 15,772; died of wounds, 14,719; total casualties, 30,491. Died from disease, 11,259. The proportion of deaths from these two causes is as 10 to 4·67. The total number of admissions of sick and wounded is not mentioned, or the number of men actually engaged, but of the entire army, out of every 1,000 men employed during the war, it is stated 45·89 died, and of these 32·20 were due to wounds received in action.

In the French army, during the same war, the admissions to hospital were—sick 339,421, wounded 131,100, total 470,521; died 136,540. It is not stated what caused the deaths. The proportion of deaths from wounds and disease admitted has never been published by the French authorities, but it is implied that the French were not near so successful in the treatment of wounded as the Prussians, whose care for the sick, medical arrangements, and system of evacuation of both sick and wounded, are much praised by the above authority. I have before noted that the French lost 23,000 men from small-pox against the Germans’ 226. See p. 147.

The Germans seem to have improved their ways and profited by their experiences during the campaign in Bohemia against the Austrians in 1866. Surgeon-Major Bostock, Scots Fusilier Guards, in his report on this campaign to the director-general of our army, wrote:—

“The surgeon-general of each army corps accompanies the head-quarters, and exercises a general medical supervision; there is also a medical director to inspect the field hospitals, but there is no special officer entrusted with the sanitary arrangements of the corps. The want of an officer for each division is admitted. Cleanliness is enjoined by the regulations, but there is no provision for its enforcement, even where practic-



able. The personal habits of the Prussian soldier are careless, and both in cantonments and the field hospitals the sanitary arrangements were unsatisfactory. There was overcrowding everywhere; the latrines, where they existed, were neglected, and there was no systematic deodorisation and removal of the excreta from cholera patients, and of the soiled bandages and dressings from the wounded. The purification of water was practised in the hospitals by boiling, charcoal, and the permanganate of potass, but in cantonments no means were taken to collect or purify the water used for drinking and cooking purposes. The spread of typhus and cholera in the army, and of pyæmia and gangrene among the wounded, has been attributed, in great measure, to the neglect of these hygienic precautions." With regard to the cholera, after speculating as to its origin, he says—"But from whatever source the cholera was introduced, there can be no doubt that it found in the ill-drained and insalubrious towns, both those crowded with sick and wounded, as well as those occupied as cantonments, and in the absence of hygienic regulations in the army generally, breeding places most favourable for its development. Brünn and its vicinity appears to have been its head-quarters; here and in the surrounding villages 1,335 Prussian soldiers lie buried. It raged also in Gitschin when crowded with wounded after the battle fought near that place, and where many hundreds died, at Prague and other places. There were altogether about 8,000 attacks of cholera in the army."

When all the stamina is taken out of men by overmarching, overcrowding, privations, want of rest, food, and shelter, they easily fall victims to disease; consequent on these conditions, after the above campaign we are told some regiments lost as many as 160, while the deaths in many averaged over 100, the immediate cause being epidemic diarrhœa, typhus and cholera, all of a class known as preventable disease. See p. 261.

To take everything out of a soldier when the very existence of a nation is at stake, is different from expending him over some minor operations of comparatively but little consequence.

In the American war 95,000 men died from wounds, while nearly double that number, 184,000, died of septic affections consequent on them.

In our recent Egyptian campaigns not a single instance of death from septic disease occurred. The only case of blood poisoning and hospital gangrene I have known in Egypt in connection with wounds in action occurred in 1882, in a hospital established by the late Lady Strangford, in an Arab house in Cairo, which was at the time in a most objectionable sanitary state. This hospital was not under our medical authorities, and they were in no way responsible for its condition.

War is a great scourge, and dysentery is the chief factor in making it so. Desgenettes states "that dysentery killed a greater number of soldiers between 1792 and 1815 than fell in

the great battles of the empire." Bowel affections and dysentery are essentially the diseases of bivouacs. Napoleon, who was fond of bivouacs, is accredited with having lost more armies than any other general. During his Egyptian campaign no less than 2,468 soldiers are said to have died of dysentery, while 1,680, died of the plague; this broke out in the army at the time of raising the siege of Acre—Napoleon's first retreat, frequently referred to afterwards as "the event which made him miss his destiny."

It would appear among civilised nations that the man-killing improvements in modern implements of war are advancing quicker than the health-preserving action of sanitary science; yet of recent years the rules for the conservancy of health are becoming so widely diffused that they will soon be observed more strictly in all armies. The means adopted for the prevention of disease and restoration of health among soldiers who become disabled, either from sickness or wounds, are becoming gradually perfected with us.



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